RACING CARS OF THE WORLD



SHELL

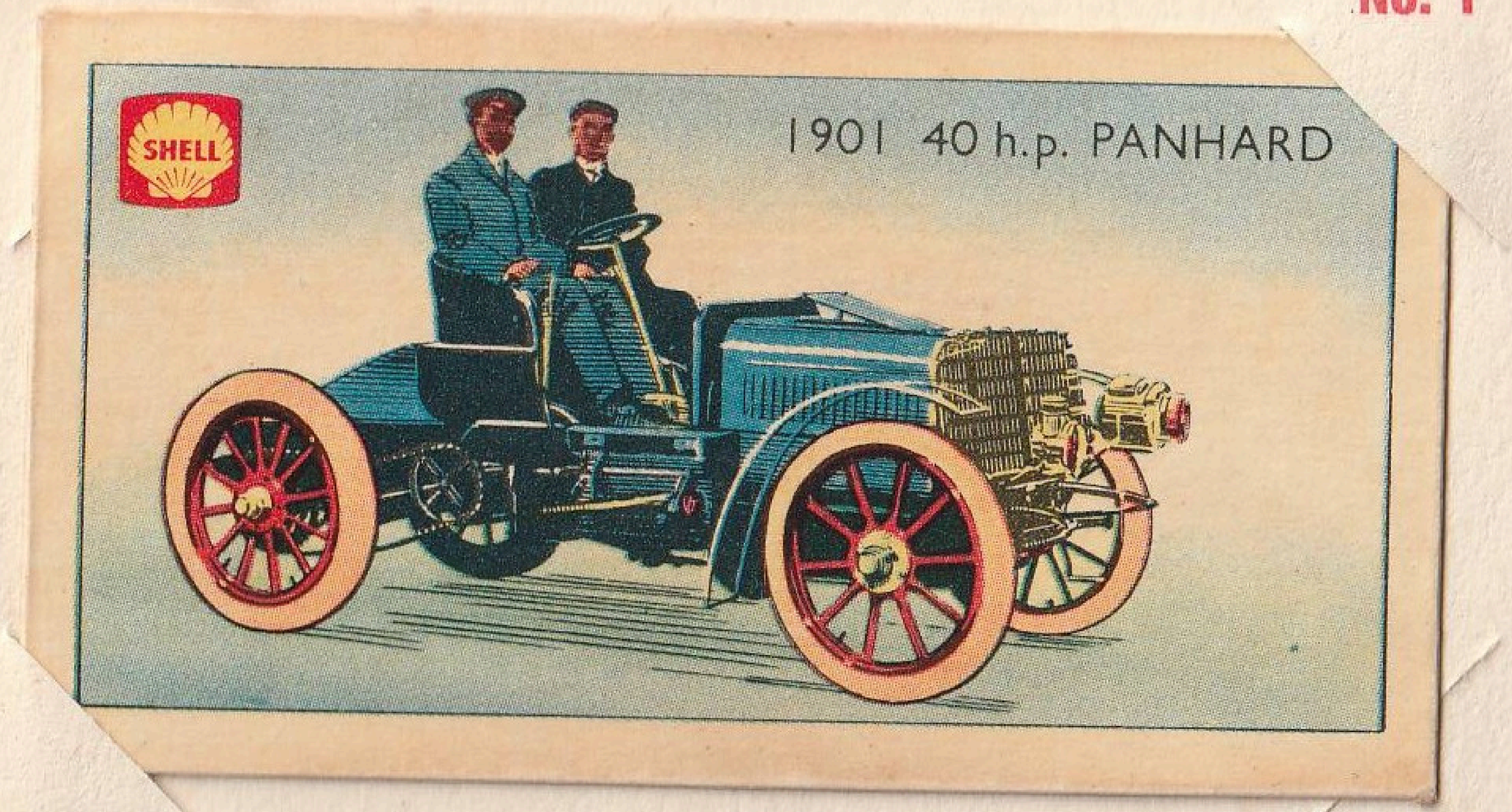
FOREWORD

The first Grand Prix for racing cars was held in 1906 at Sarthe in France. The race was over a distance of 770 miles and lasted two days. It was won by Sziz, a Hungarian, driving a 13 litre Renault at an average speed of 63 mph. The following year the Grand Prix was won by a 16 litre Fiat at 70.05 mph and in 1908 by a 12.8 litre Mercedes at 69 mph. The first three races were won by French, Italian and German machines. In 1921, the race was won by a Duesenberg, an American car. This was America's first and last success. In 1923, British Sunbeams came 1st, 2nd and 4th. Segrave, the winning driver, averaging 75.3 mph. In 1962, the French Grand Prix was won by D. Gurney driving an 8 cylinder Porsche at an average speed of 101.8 mph.

The $1\frac{1}{2}$ litre engine of the Porsche is less than one-tenth the size of the 1907 16 litre Fiat. The huge ungainly cars of 1906, 1907 and 1908 have been bred by Grand Prix racing into slim, thoroughbred machines tempered and tuned to perfection in the flame of competition. But it is not only power output that has improved; tyres, suspension, brakes, roadholding, fuels and lubricants have changed entirely as a result of Grand Prix racing. Many of these improvements have been incorporated in the modern car. We all benefit indirectly from the work of the racing car designer.

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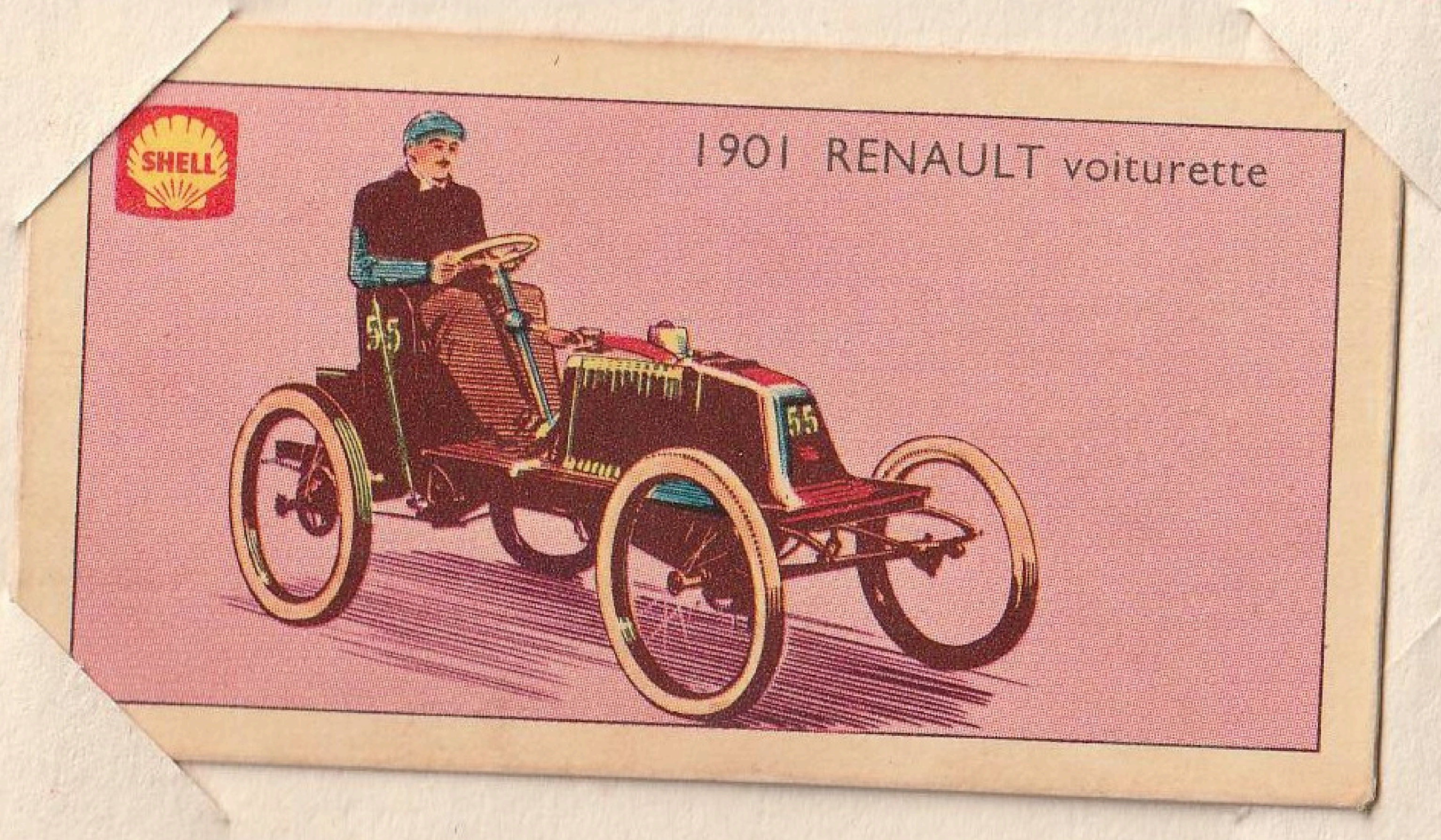
No. 1



1901 PANHARD

This 40 hp car won the 1901 Gordon Bennett race. It had a flimsy wooden frame, a quadrant gear change and a constant speed engine which was probably governed at about 800 rpm. The normal procedure to change gear on a hill was to wait until the engine had slowed to say 500 rpm, move the gear lever to neutral, as the first stage of double-declutching, and then to allow the engine to regain its normal speed of 800 rpm, at which point the next lower gear could be silently engaged.

No. 2

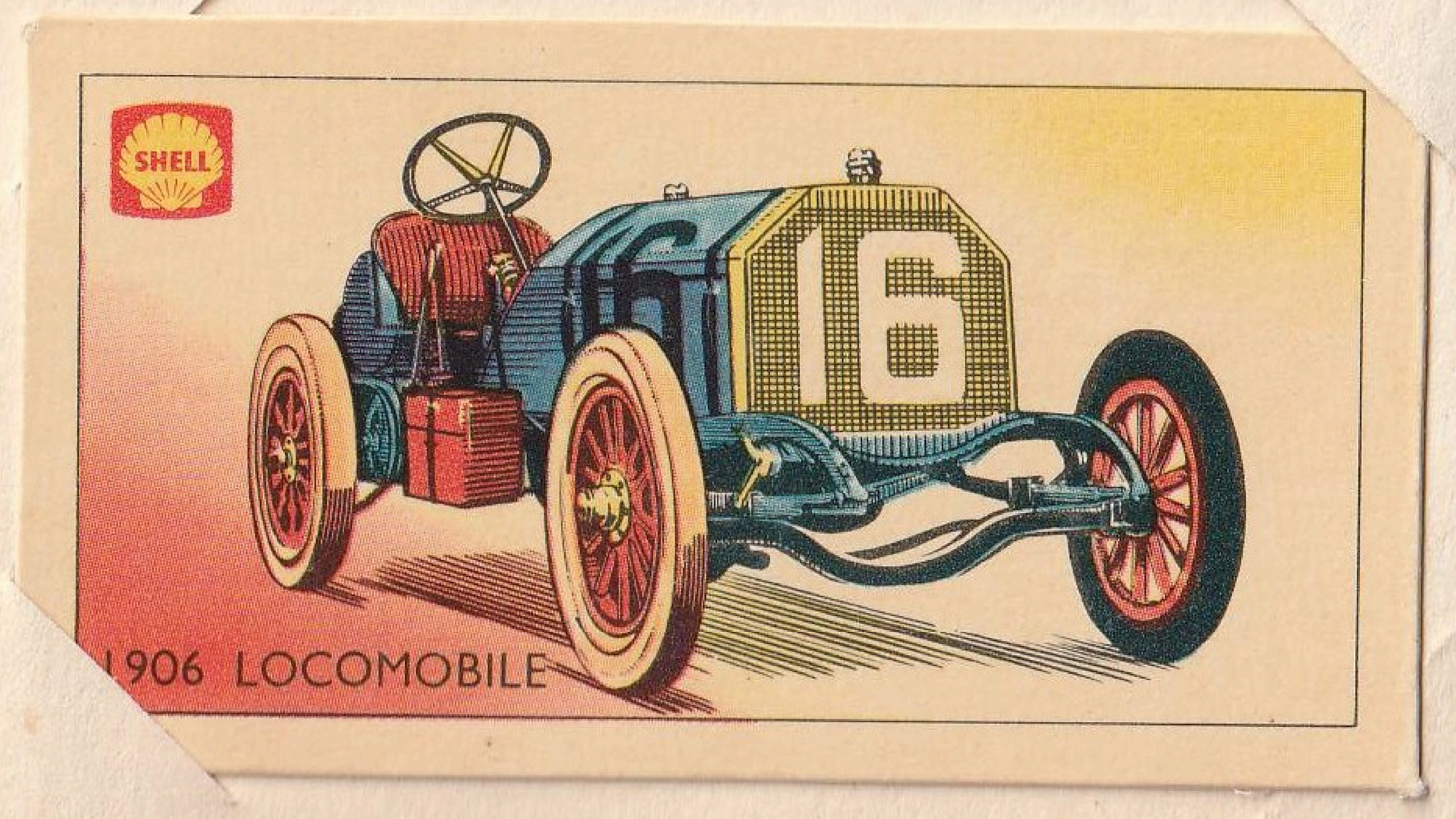


1901 RENAULT

Louis Renault was a well-known driver as well as a manufacturer. This car came in the "voiturette" class, and therefore weighed less than 250 kilogrammes (less than 5 cwt). It had a single cylinder engine of 1 litre capacity, and racing against cars such as the 3 litre Panhard, and the 10 litre Mors, it averaged 36.9 mph.

Tyres gave a great deal of trouble on these early cars, and since there were no detachable wheels or rims, punctures had to be repaired in situ.

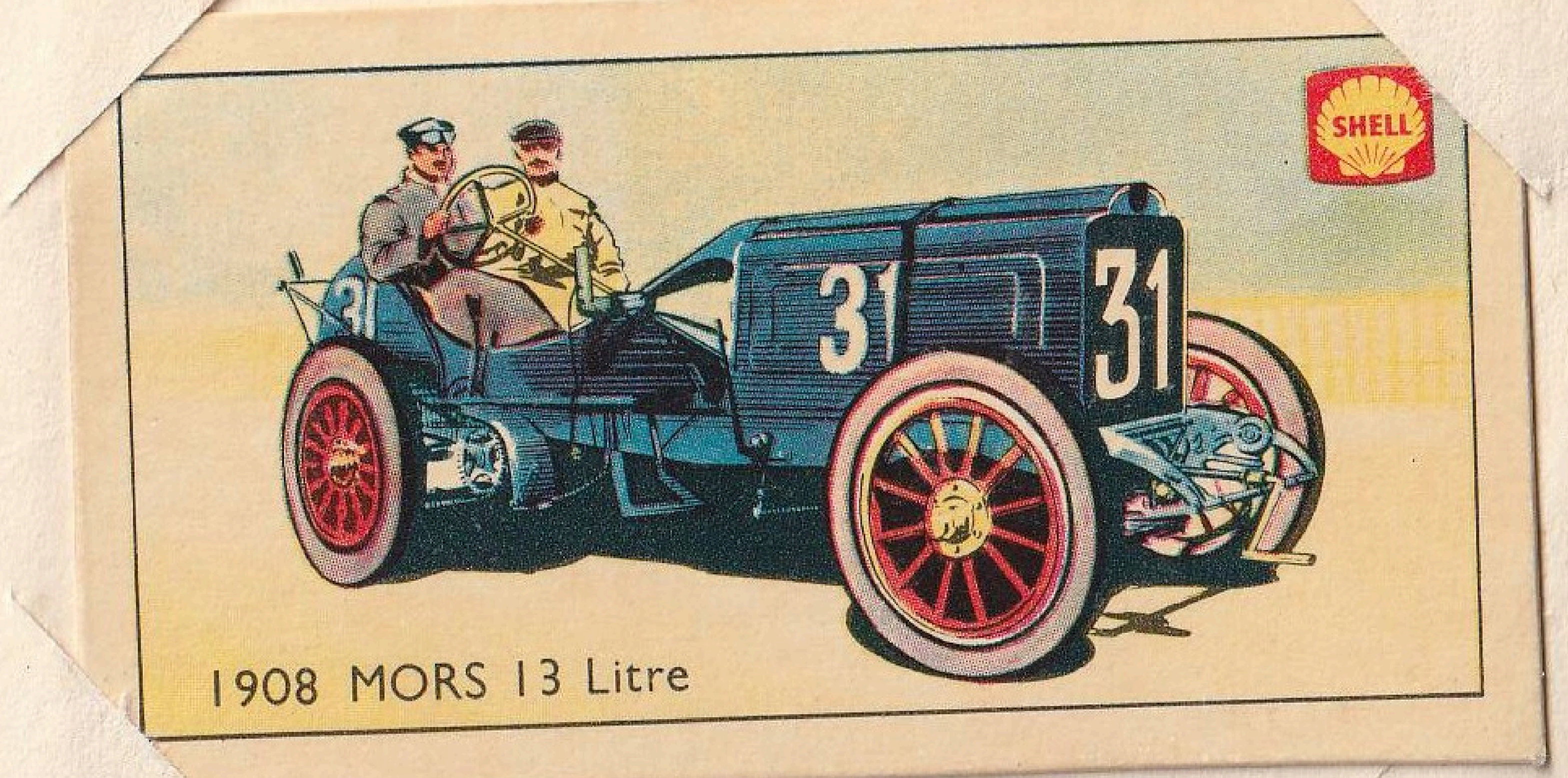
No. 3



1906 LOCOMOBILE

This car was of American manufacture, but was built on typical European lines. It was the car that gave the Americans their first victory in their own race — the Vanderbilt Cup. This race originated in 1904, and the Locomobile won the event in 1908, there being no meetings in 1906 or 1907. This race created tremendous interest in America and in many ways was probably the most exciting ever held in the U.S.A.

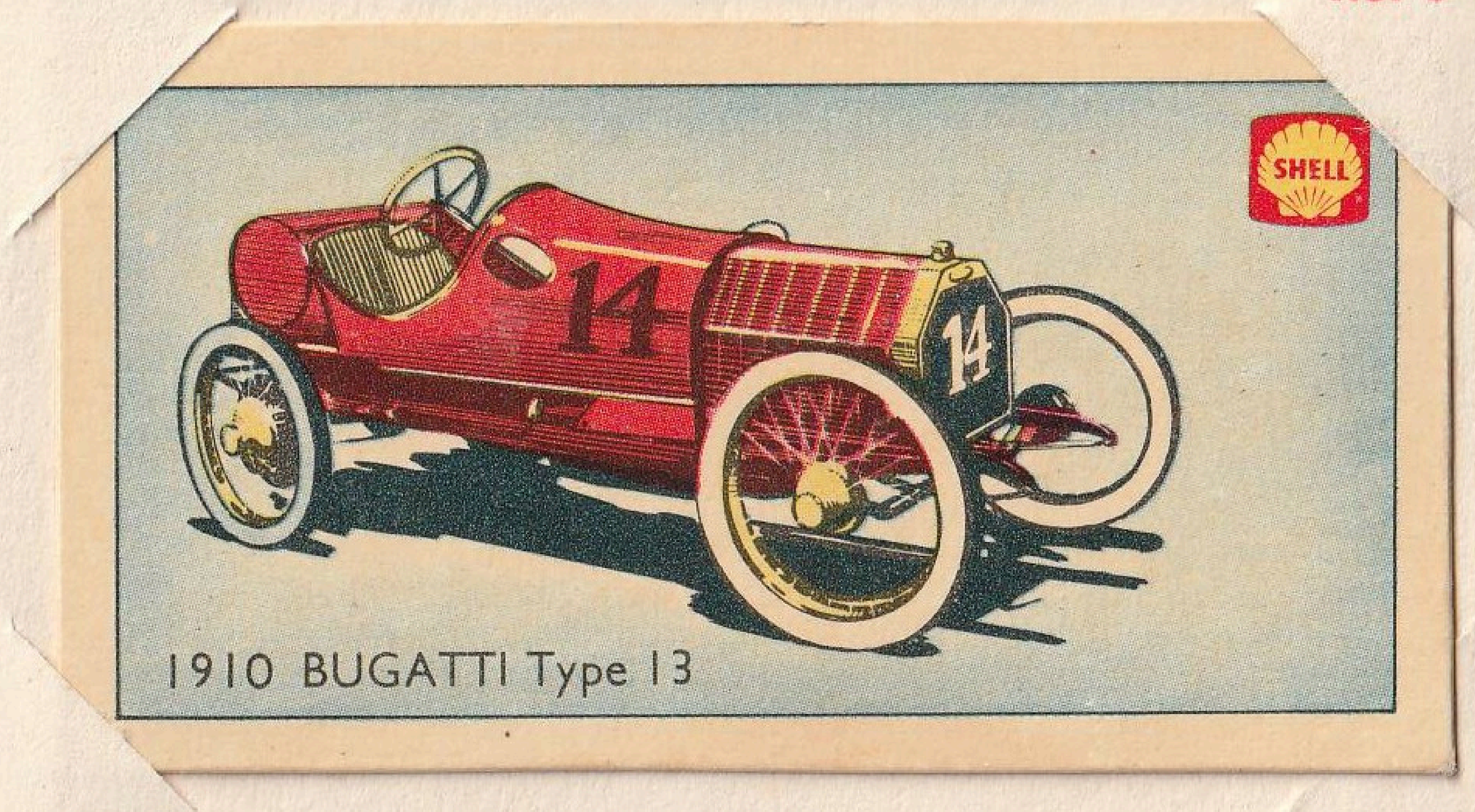
No. 4



1908 MORS

This Mors had a four cylinder engine of 13 litres capacity and was built by a firm started in 1898 which used racing as a means of establishing their reputation. In 1898 they produced a V4, 1.7 litre car and in 1901 won the Paris–Berlin race with a 10 litre car at an average speed of 44.1 mph. In 1901 Mors used shock absorbers on a 9¼ litre model for the first time on any car and the bodywork of this car had more than a hint of streamlining.

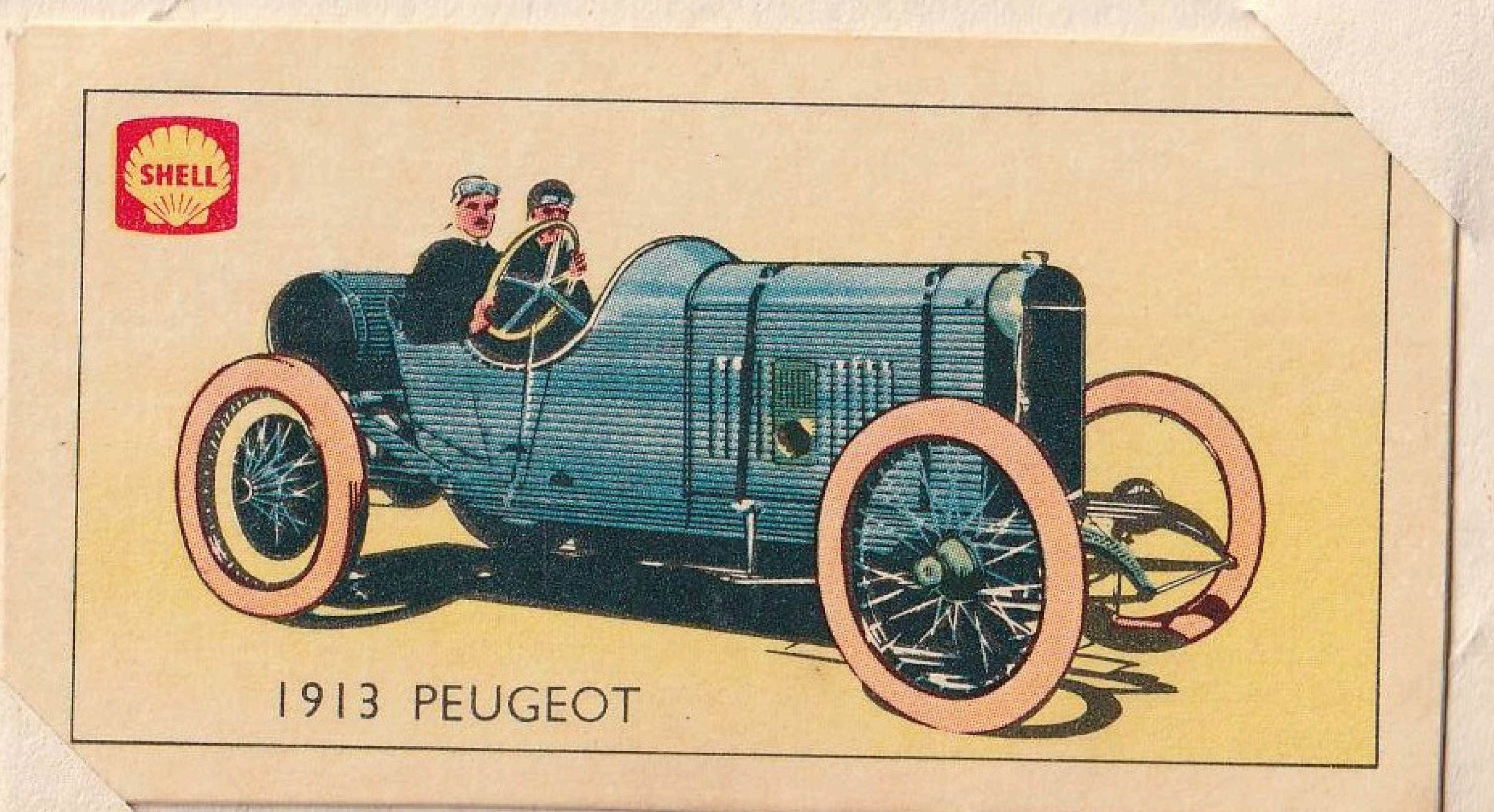
No. 5



1910 BUGATTI Type 13

This was virtually the forerunner of the modern high-efficiency engine. It was a four cylinder 65 x 100 mm 1.3 litre model and weighed only 6 cwt. It finished second in the unlimited class in the Grand Prix at an average speed of 46 mph. One model of this car survives today and its maximum rpm are about 2900 giving it a speed of about 60 mph. In 1911 Bugatti experimentally put two of these engines end to end to produce the first small straight eight (2.6 litre). It reached 86 mph.

No. 6

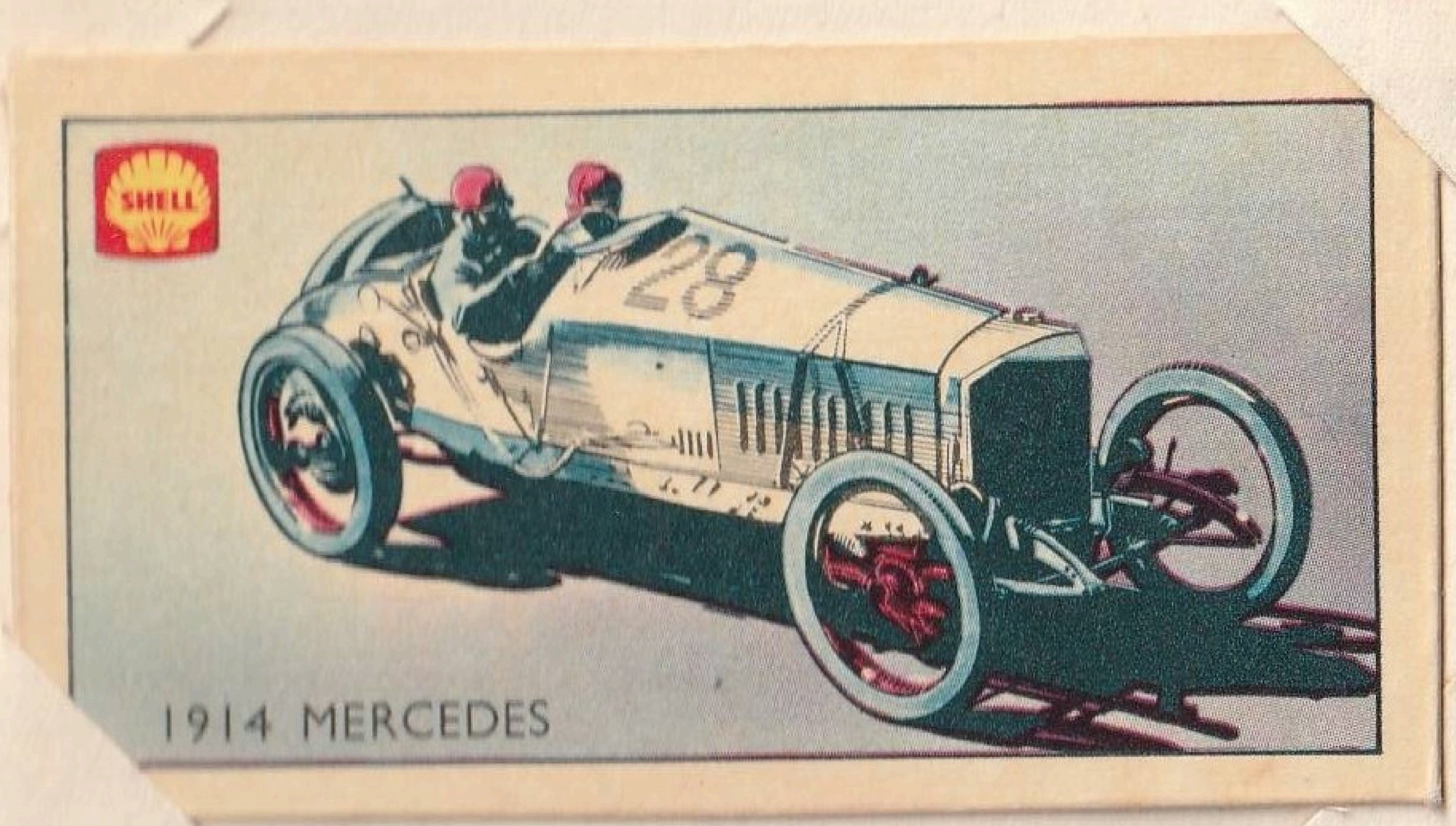


1913 PEUGEOT

In many ways this car forecast modern practice. Driven by Goux it won the Grand Prix of America at Indianapolis in 1913. The high bonnet enclosed the long stroke engine of 78 x 156 mm. The capacity was 3 litres, it had 4 ohv per cylinder in hemispherical heads and produced 90 bhp at 3000 rpm, giving a maximum speed of 95 mph. The enormous steering wheel was typical of the time, since considerable strength was needed to turn the front wheels.

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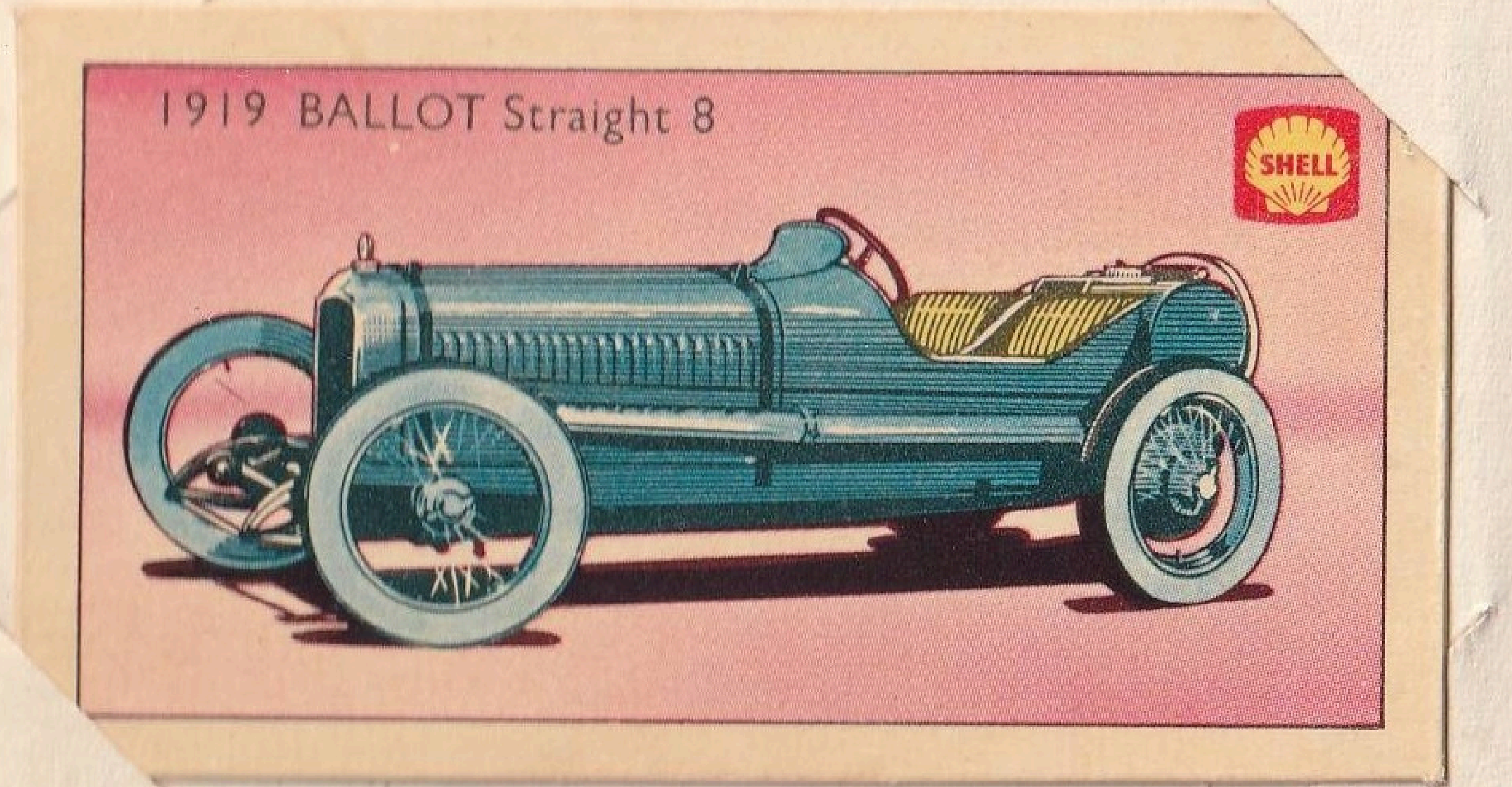
No. 7



1914 MERCEDES

Like the 1913 Peugeot, this Mercedes had four overhead valves per cylinder, but operated by only one overhead camshaft. There were three spark plugs per cylinder, and two magnetos. The cylinders were 93 x 165 mm and the bhp was 115 at 2800 rpm. Mercedes had not at this stage adopted front wheel brakes. In the 1914 Grand Prix five of these cars were driven to team orders; this together with their extreme reliability gave victory to Lautenschlager driving No. 28.

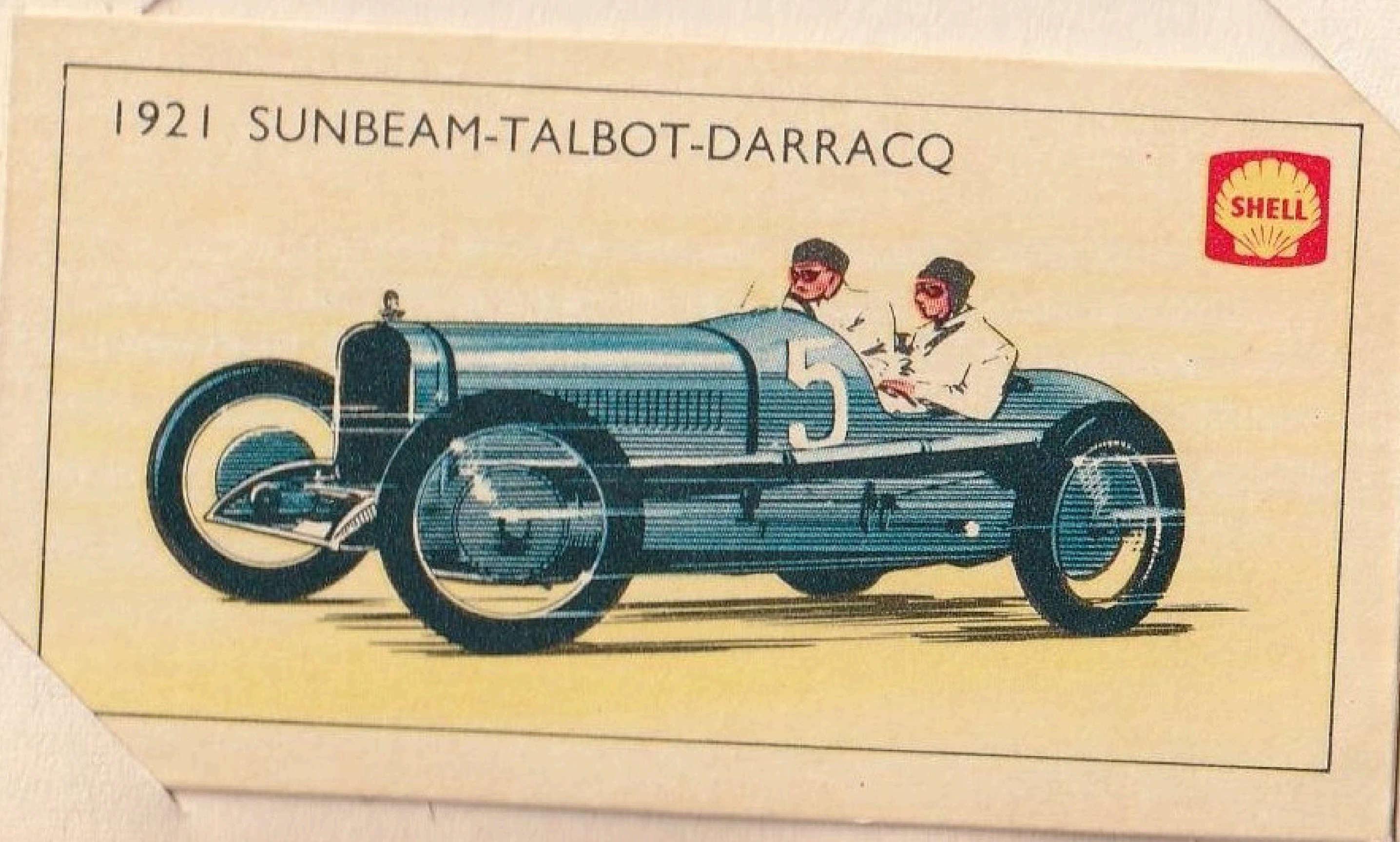
No. 8



1919 BALLOT

This 5 litre was Europe's first straight eight racing car. It was designed by Ernest Henry and four were produced in only fifteen weeks at a cost of £30,000. The cars were powered by a 4894 cc 74 x 140 mm engine, with twin overhead camshafts operating four valves per cylinder, in a non-detachable head. Designed primarily to compete in the Indianapolis 500, two cars were raced against America's first straight eights, the Duesenbergs, but they suffered from tyre troubles and were unsuccessful.

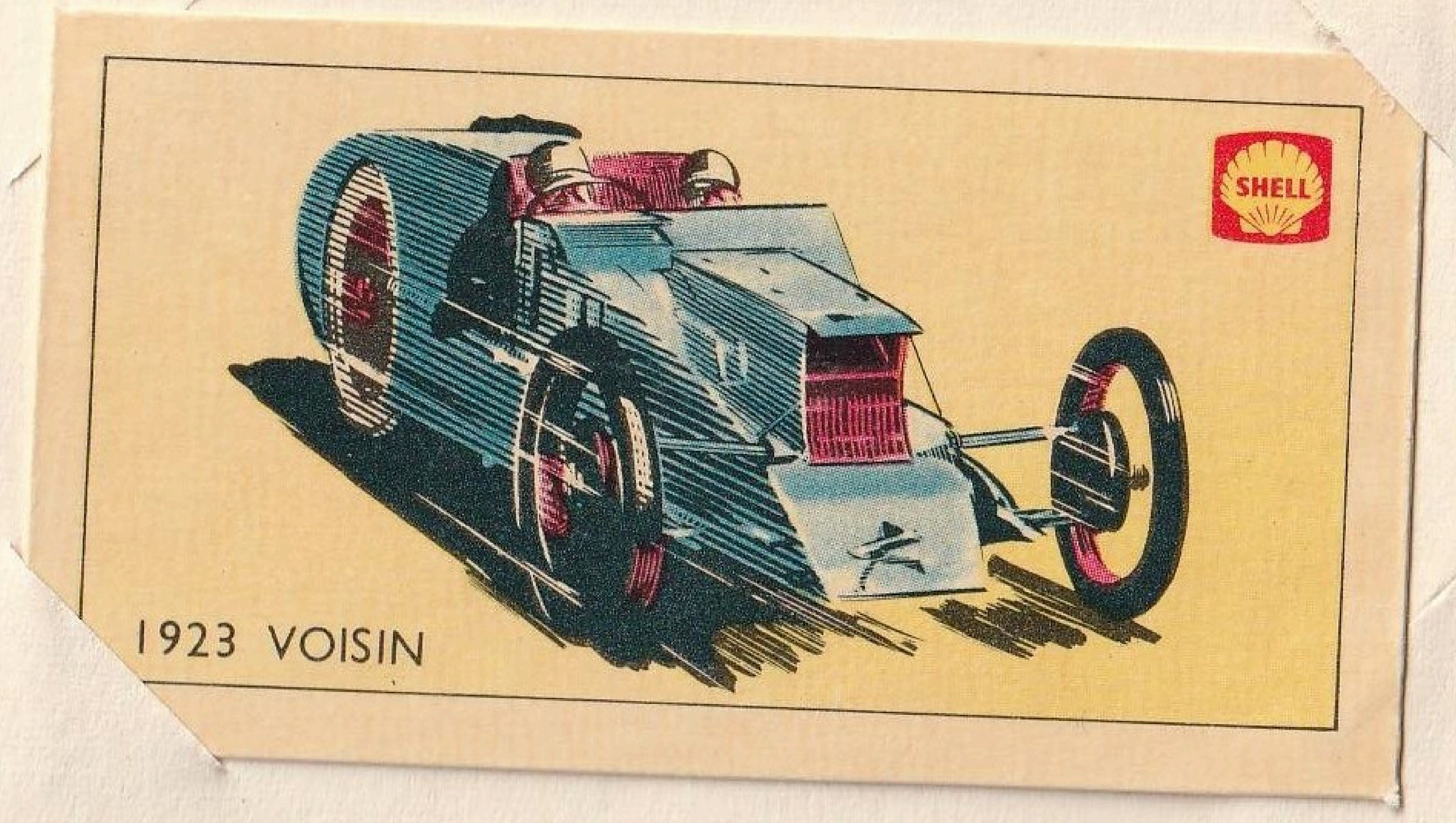
No. 9



1921 SUNBEAM TALBOT DARRACQ

Another straight eight, this engine, with bore and stroke of 65 x 112 mm was cast in aluminium in two blocks of four cylinders. It had steel liners, fixed heads and phosphor bronze valve seats, alloy pistons and four valves per cylinder. No flywheel was fitted. The engine developed 108 bhp at 4000 rpm. Seven of these cars were produced at a cost of about £50,000, but preparation for Grand Prix racing was extremely bad. The following year however, one of these cars running as a Sunbeam, won the T.T.

No. 10

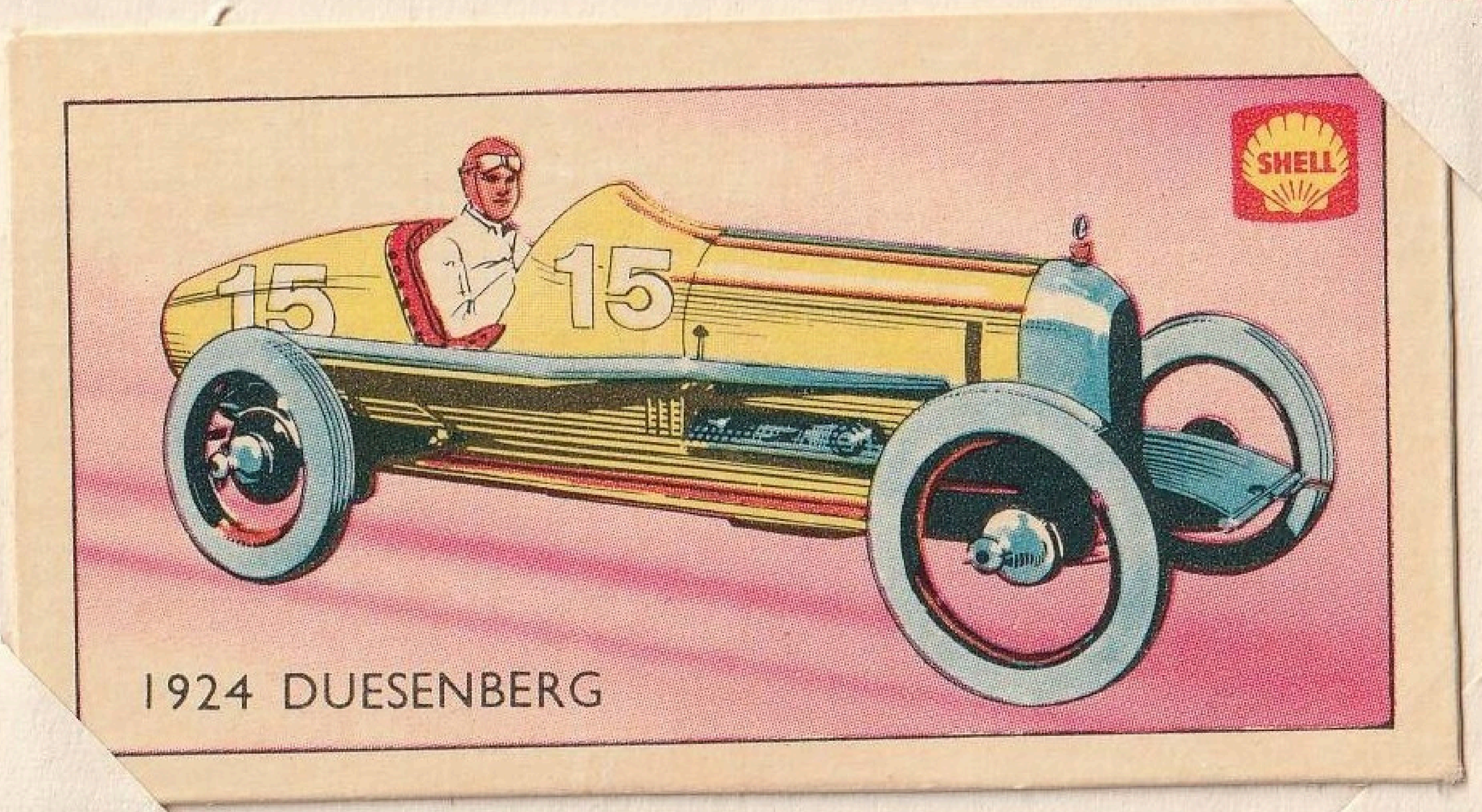


1923 VOISIN

Produced by pioneer airman Gabriel Voisin, this sensational but eccentric design had very narrow tracked rear wheels enclosed in the bodywork. This wa. an attempt at streamlining. The engine was a six cylinder of 62 x 110 mm with sleeve valves, and power output was low.

In the same year Bugatti produced a very odd looking car, too — a straight eight with enveloping body and a very short wheelbase of 6' 7". It was very fast, but too short and unstable.

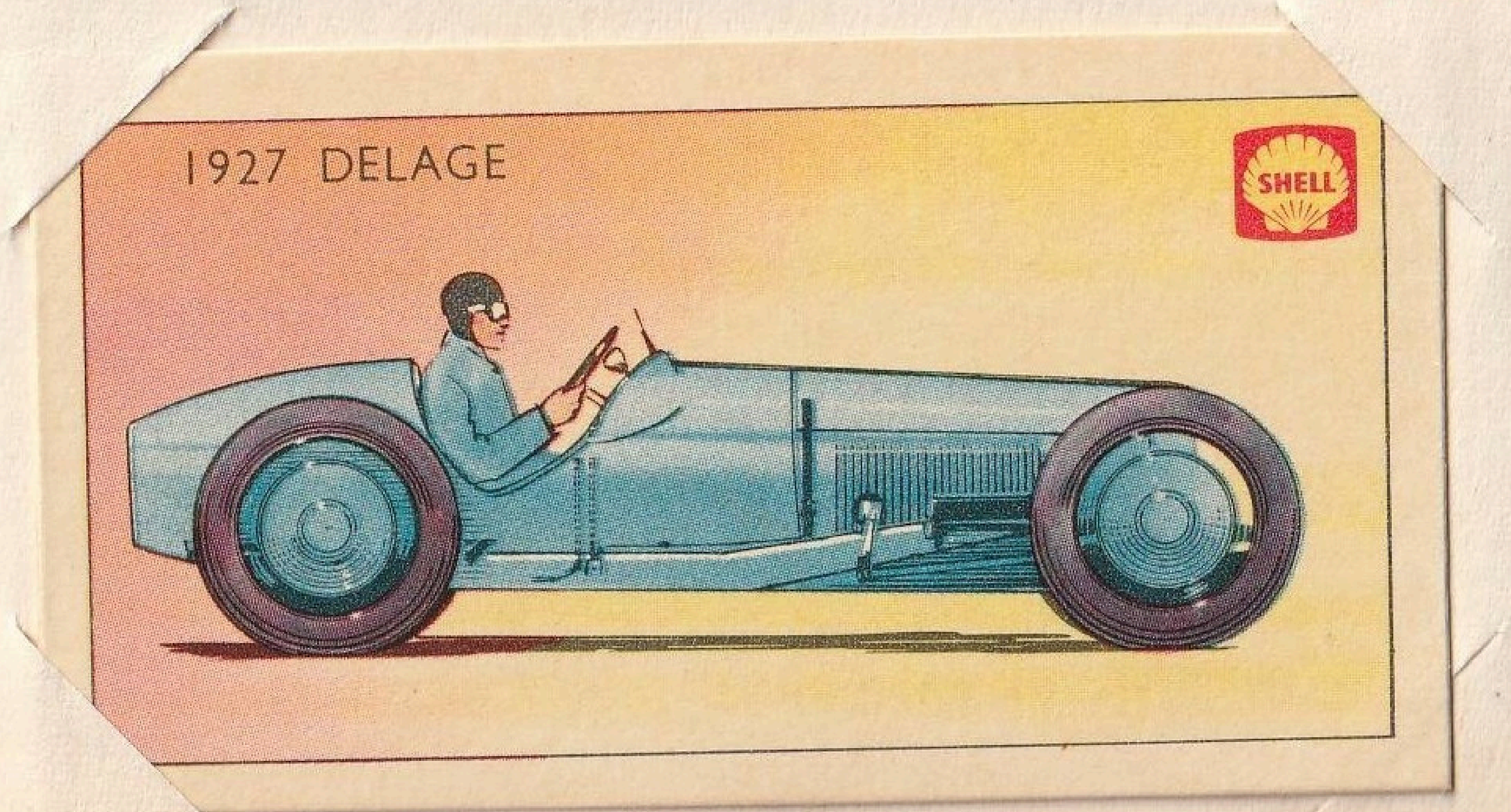
No. 11



1924 DUESENBERG

At Indianapolis in 1924, Duesenberg sprang a surprise by fielding three of these cars fitted with superchargers, one of which won the race at a record speed of 98.24 mph. The blower was geared to run at 40,000 rpm when the crankshaft was turning at a mere 5000 rpm. The supercharger gave a good boost at high speed but this fell off rapidly as speed dropped. It was thus ideal for a high speed track but unsuitable for road racing.

No. 12

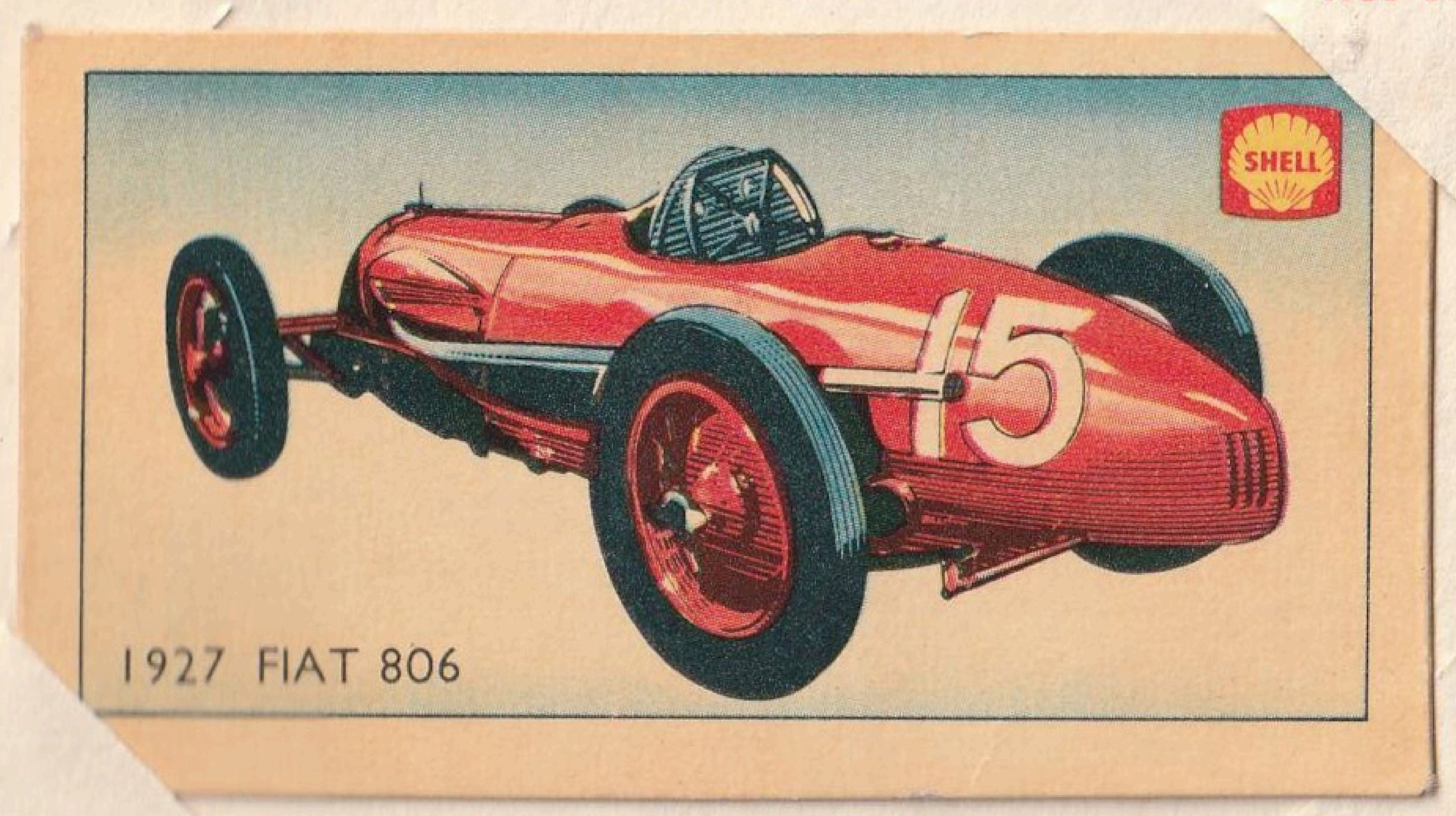


1927 DELAGE

"One of the immortals", this Delage had a straight eight, 55x76 mm, 1484 cc engine and incorporated over 60 roller or ball bearings. It had twin overhead camshafts, each running in eight roller races, the crankshaft had ten separate roller bearings with eight roller big-ends. A supercharger, driven at engine speeds, helped produce 177 bhp at 8000 rpm. It was unbeatable, and running in four Grands Prix, Delage won them all and took 2nd and 3rd places as well in two of them.

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No. 13

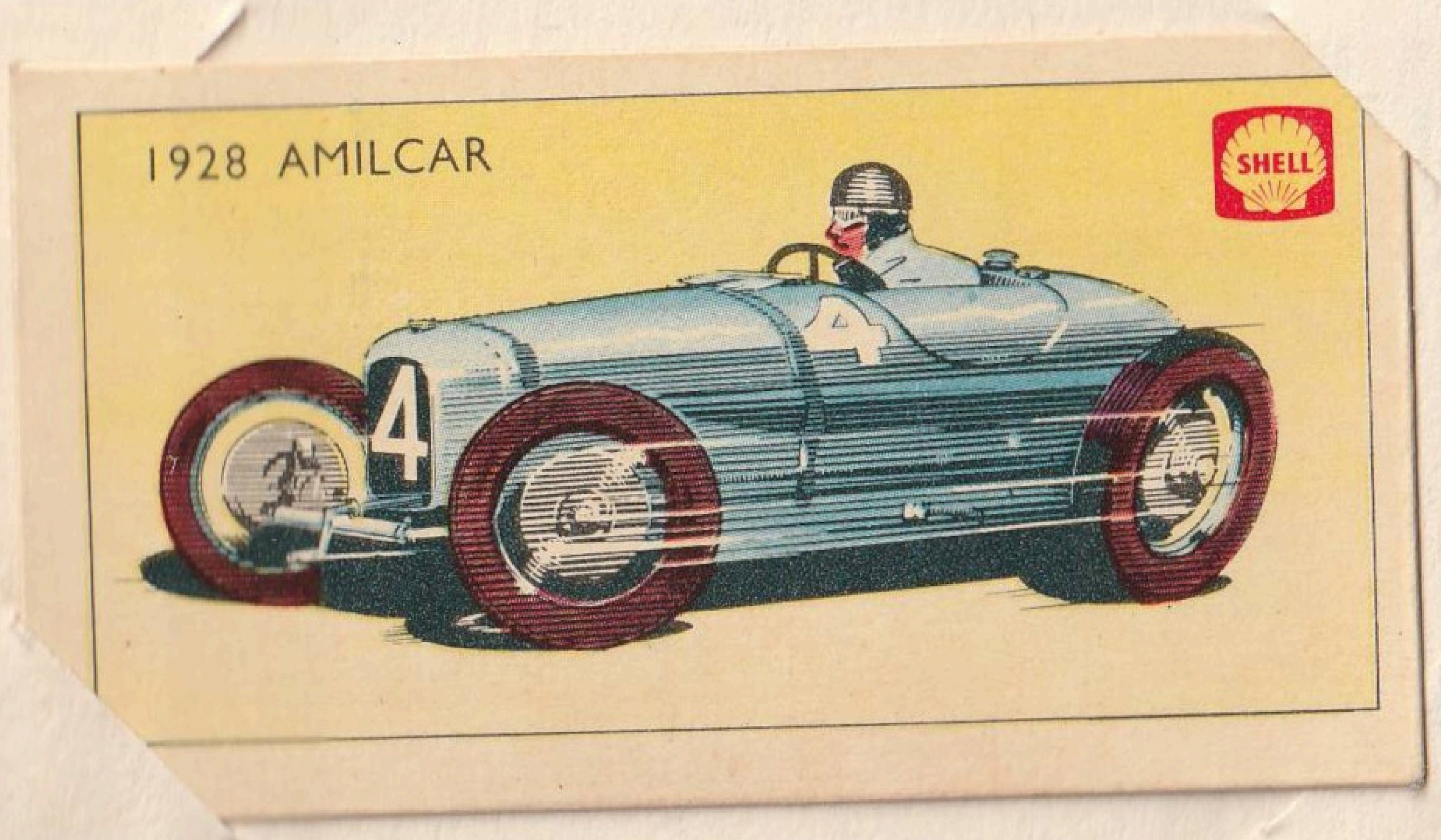


1927 FIAT Type 806

Built in 1927, this car was the last of the racing Fiats, and raced once at Monza, winning against sundry larger Alfa Romeos and Bugattis at an average of 94.57 mph.

It was a very remarkable car. Capacity 1500 cc, it had twelve 50 x 63 mm cylinders in two vertical banks of six, and two side-by-side crankshafts geared together. There were three overhead camshafts, the central one for the inlet valves and two outer ones for the exhaust valves. It was fitted with a Roots blower and developed 175 bhp.

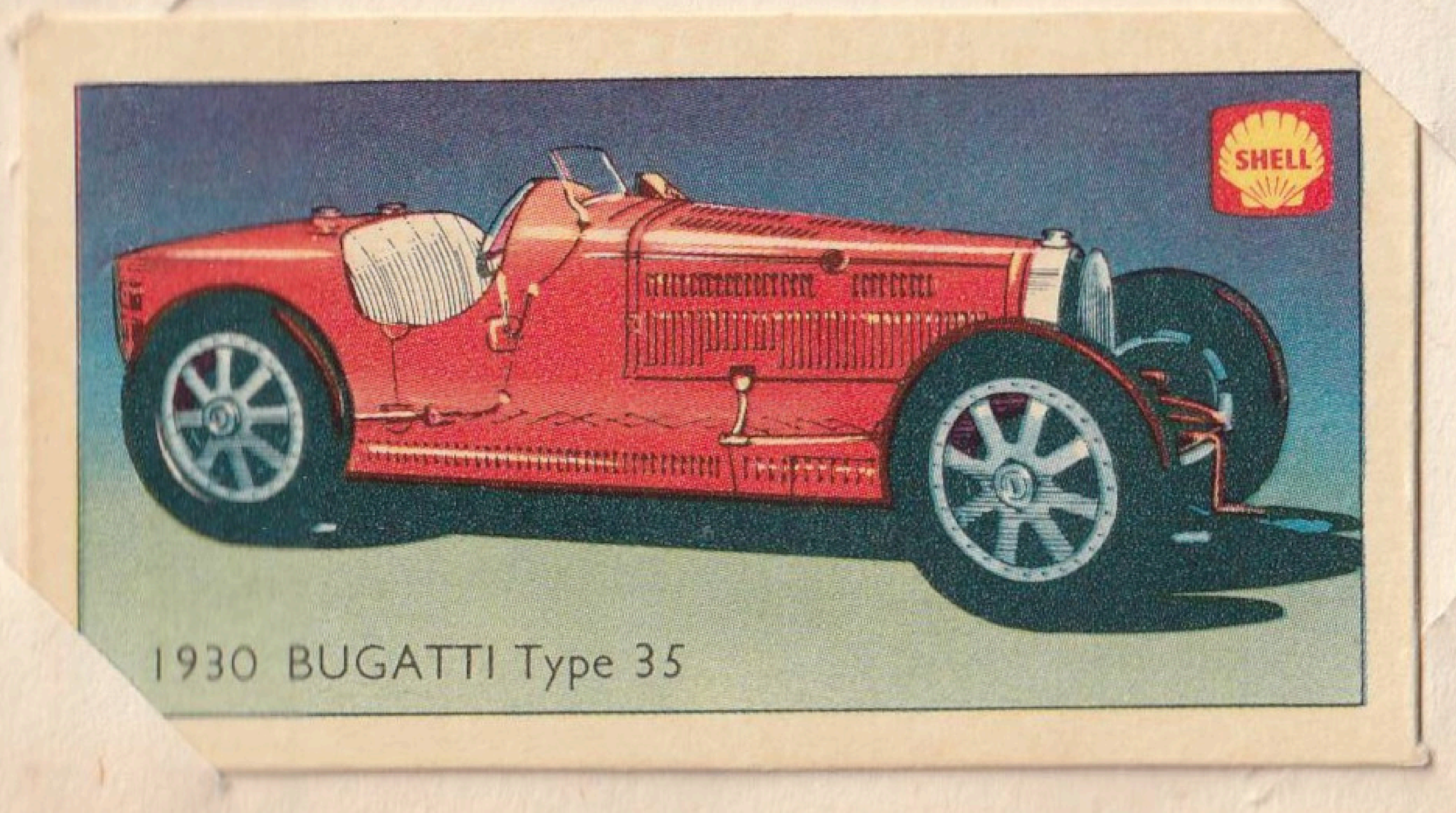
No. 14



1928 AMILCAR

A beautifully made car with a six cylinder, twin overhead camshaft engine of 55 x 77 mm and 1097 cc equipped with a Roots type blower and Solex carburettor. The big ends and seven bearing crankshaft had roller bearings. The car had no differential and weighed only 8½ cwt. It lapped Montlhery at 118 mph early in life and for many years gained victories wherever it was raced. Even today vintage events are still being won by these cars.

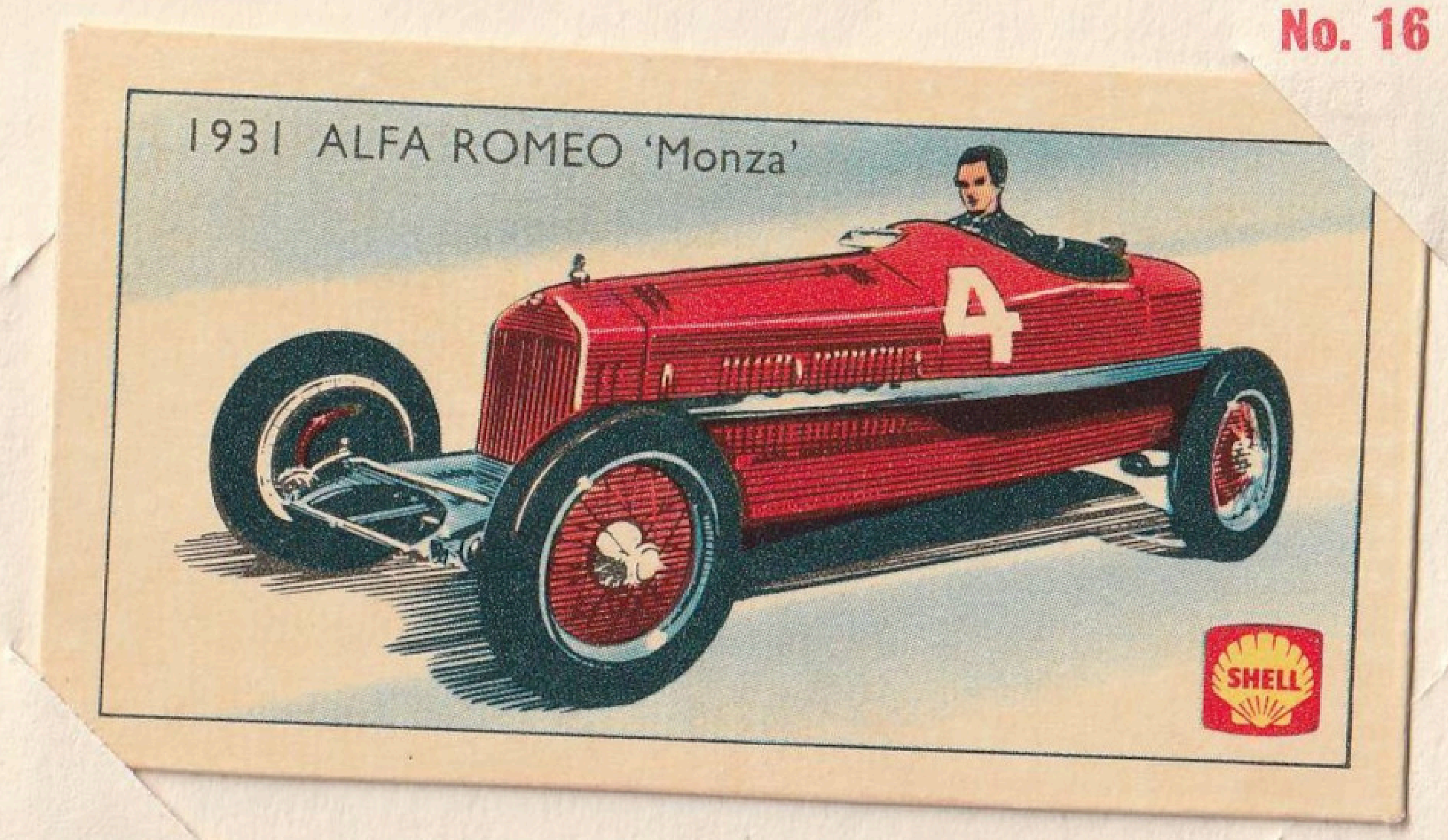
No. 15



1930 BUGATTI 35

This was one of the most successful racing cars of all time. Originally built in 1924, when it developed 100–105 bhp at 5200 rpm, it was developed through the years until 1930. The engine was a straight eight of 60 x 88 mm (1990 cc). Maximum revs. were about 7000 rpm, and its low-speed torque was excellent. The wheels were of cast aluminium alloy with eight broad flat spokes integral with rims and brake drums. It appeared also as a 2.3 litre and in supercharged form.

No. 16



1931 ALFA ROMEO

This, the type 8c or "Monza", had a 65 x 88 mm, 2336 cc straight eight engine in two cast iron blocks of four. Between the two blocks was the gear train driving supercharger, oil and water pumps and twin overhead camshafts. The engine produced 160 bhp at 5400 rpm and was developed later to 190 bhp. It appeared also as a sports car and won the Le Mans 24 hour race for four years in succession. As with the Bugatti, many of these cars were supplied to private customers.

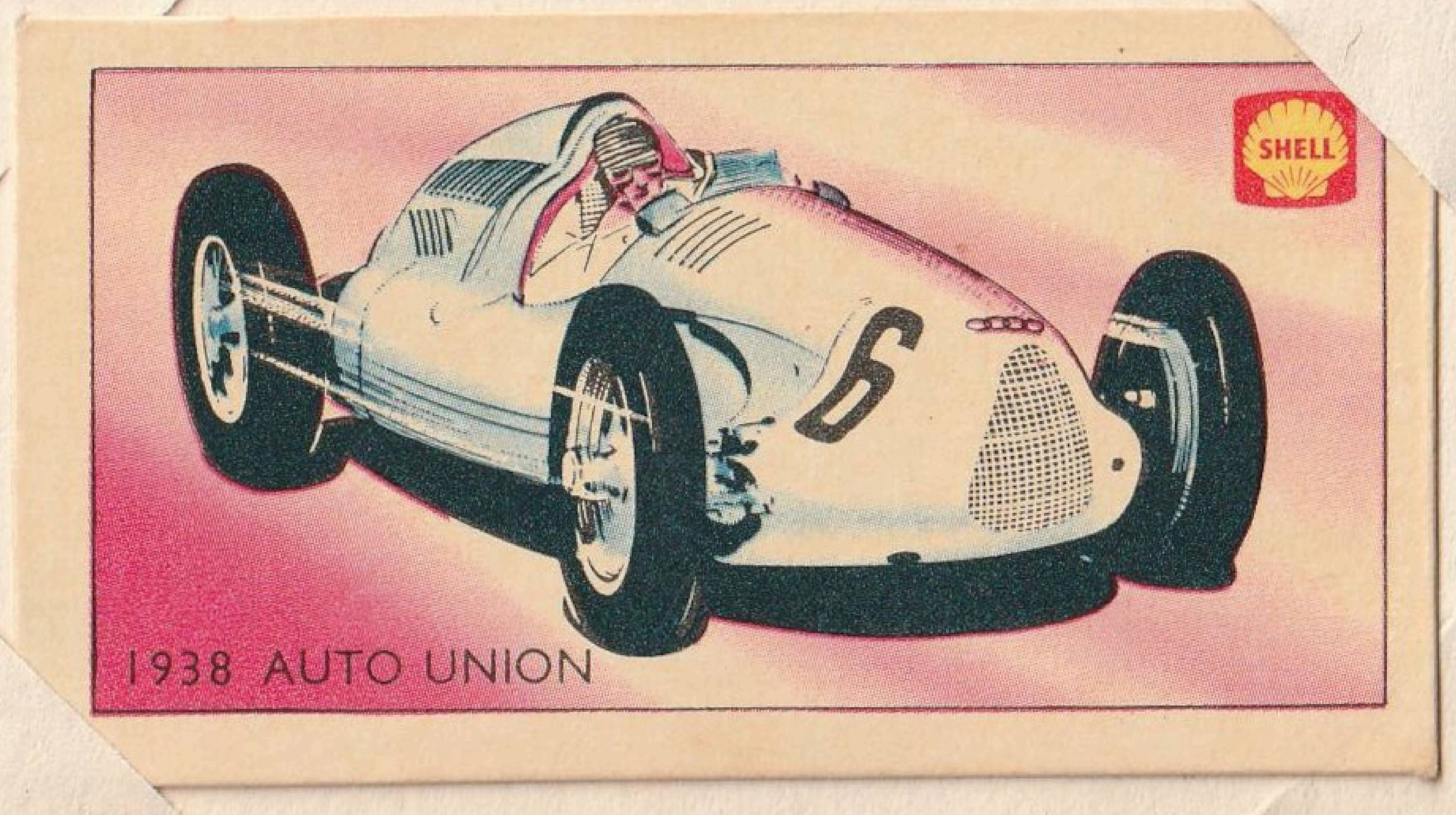
No. 17



1935 GILMORE SPECIAL

As with most American racing cars about this time, the car had a Miller engine and was mostly Miller built. Mechanics were still carried in American races until 1938, the driver sitting slightly forward to give him room to work and to reduce overall width of the car body. The car won the Indianapolis 500 in 1935 averaging 106.24 mph. The first ten cars to finish had Miller engines, and in fact of the first 33 cars to complete the course, 24 were Miller engined.

No. 18

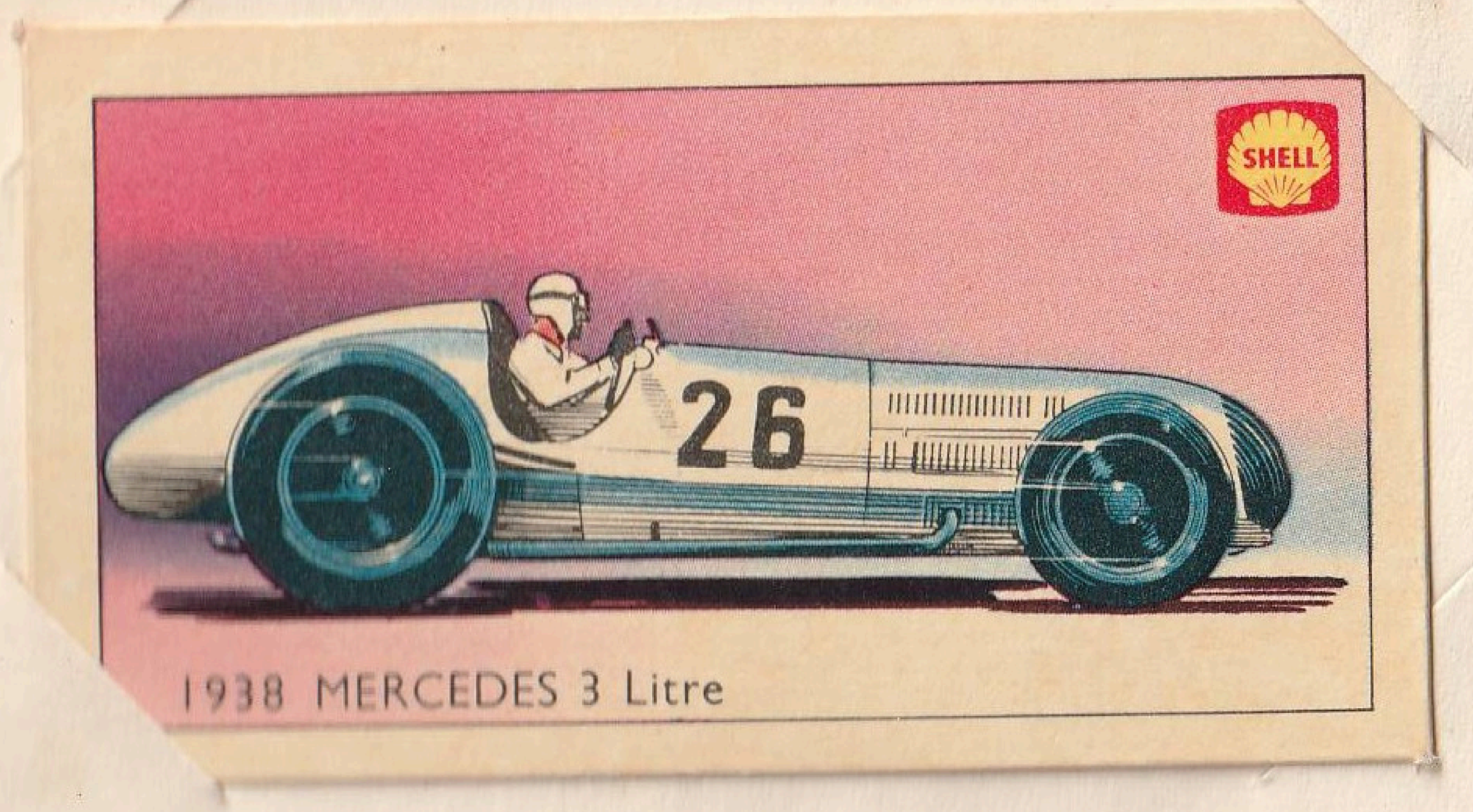


1938 AUTO UNION

These rear-engined cars were the rivals of Mercedes for the world championship in the period before the last war. They were tricky to handle and not very popular with drivers. The 2.99 litre V12 engine with bore and stroke of 65 x 75 mm, delivered 400 bhp at 7000 rpm. Three overhead camshafts were used, one operating the inlet valves, and one on each side operating the exhaust valves. A Roots type blower was fitted at the rear of the crankcase.

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No. 19

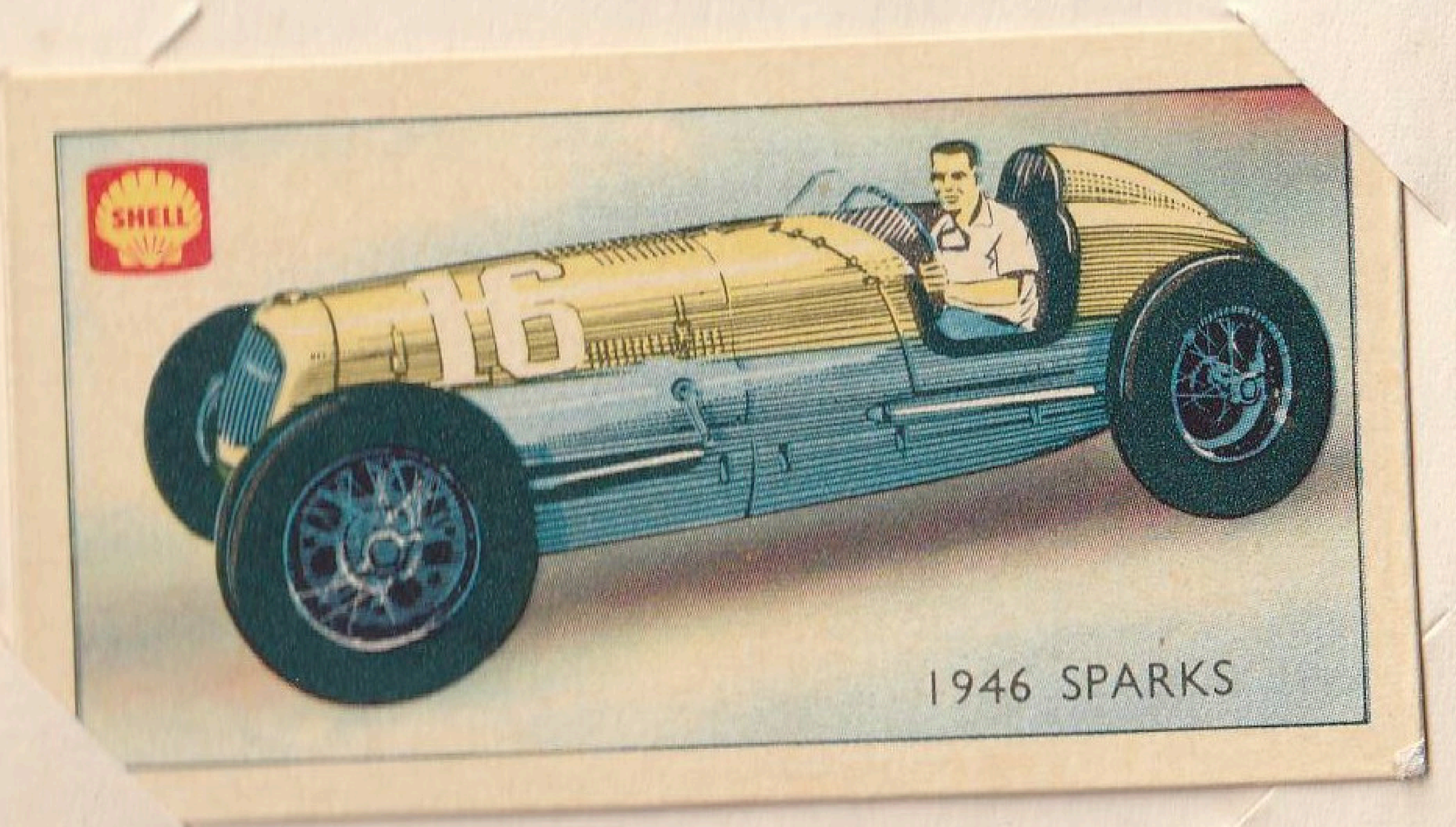


1938 MERCEDES 3 Litre

1938 MERCEDES BENZ

This fabulous car had a V12 engine of 2.96 litres, supercharged by two Roots blowers, giving 420 bhp at 7800 rpm. The engine was mounted at an angle to the centre line of the chassis and lowered at the rear so that the driver could sit very low with the propellor shaft passing alongside his seat. Under racing conditions petrol consumption was barely 3 mpg and finally 88 gallons of fuel were carried. A rear shock absorber control was provided to compensate for the 5 cwt difference in weight from full to empty.

No. 20

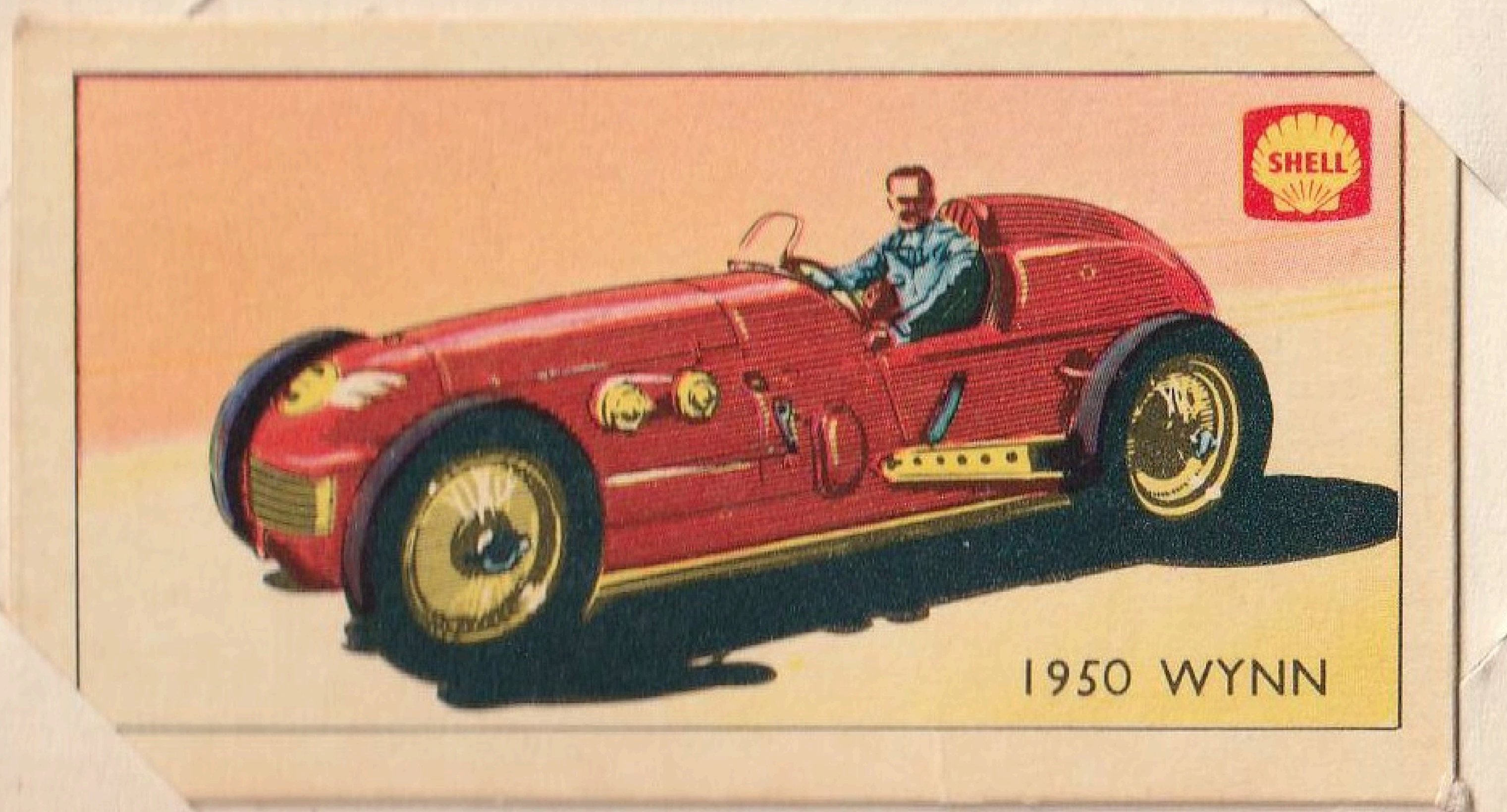


1946 SPARKS

1946 SPARKS

George Robson won the first Indianapolis 500 after the war in this Sparks Special. It was the first "six" to win this race since the Marmon's victory in 1911. Two cars were built by Sparks in 1937 and raced at Indianapolis in 1938, 1939 and 1941. This 1946 Sparks Special was probably made up from parts of both original models. The 1946 race was memorable in that there were 19 retirements from the 33 starters, probably because many of the cars had been stored away for so long during the war.

No. 21



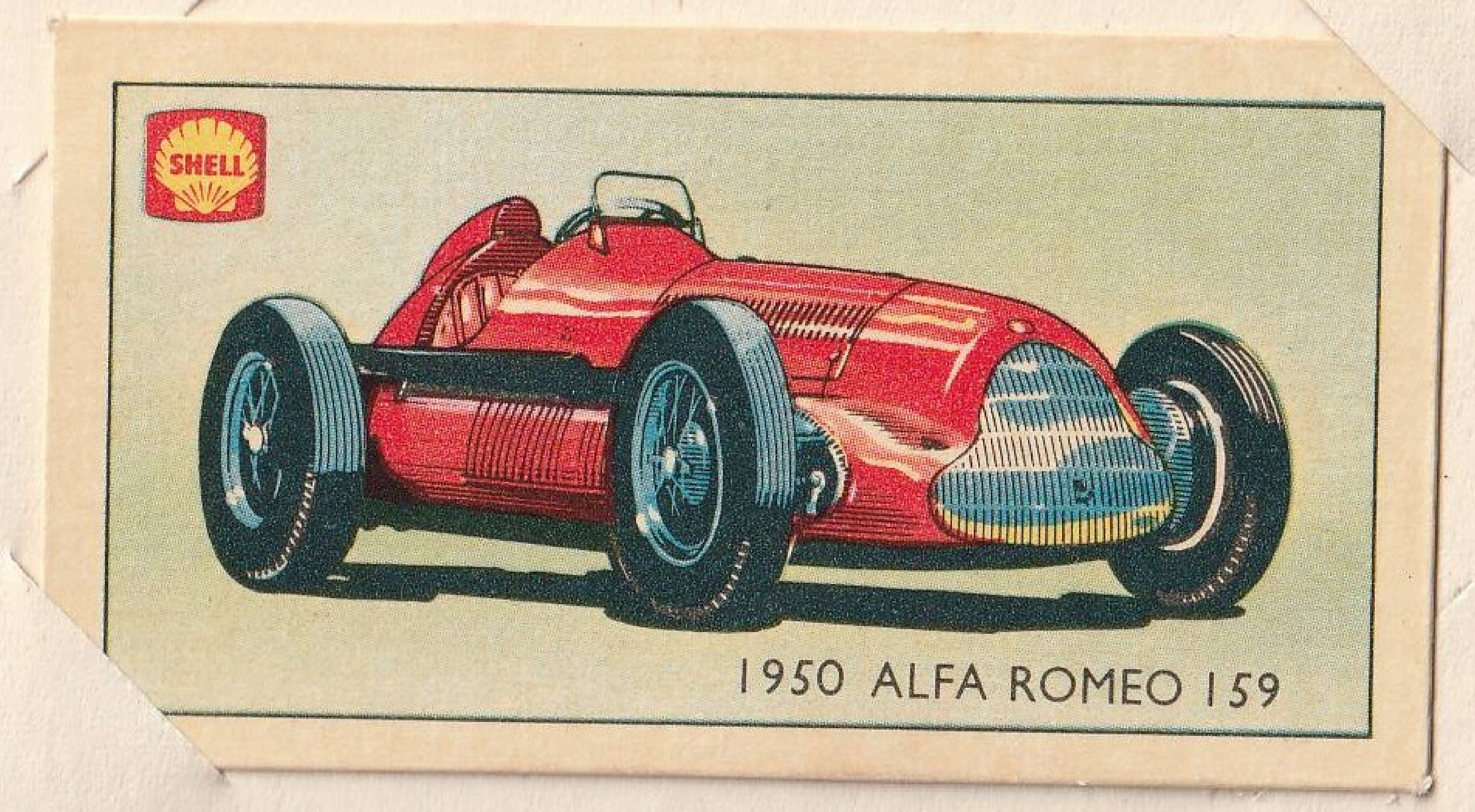
1950 WYNN

1950 WYNN

The full title of this car is the "Wynn Friction Proofing Special" and typifies the difference between Continental and U.S. racing outlooks. Most American cars are "specials" built around well known engines, to race on tracks, such as Indianapolis, and are unsuitable for European road racing.

The car illustrated, driven by Johnnie Parsons, won the American Classic — the Indianapolis 500 — in 1950 at an average speed of 134.3 mph, the race being shortened to 345 miles because of rain.

No. 22

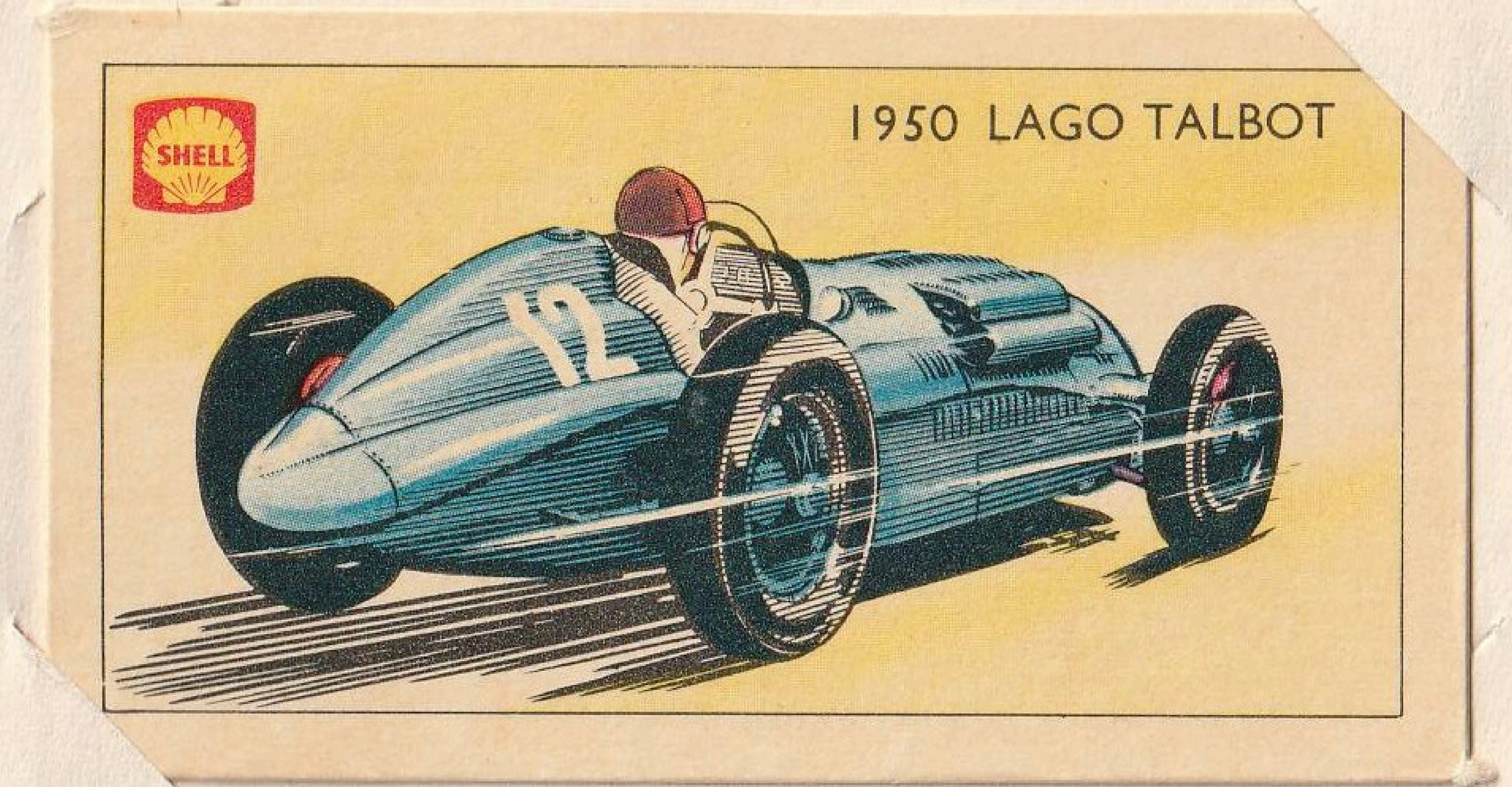


1950 ALFA ROMEO 159

1950 ALFA ROMEO 159

The engine of this car was virtually half of the 3 litre V16 engine, making a straight eight of 1½ litre, 50 x 70 mm. With careful attention to supercharging and the design of the exhaust system, speed was increased to 8500 rpm at which it developed 350 bhp. With better drivers and more efficient organisation than the opposition, this Alfa Romeo quickly led the Grand Prix field — a great achievement for a design first laid down in 1938.

No. 23

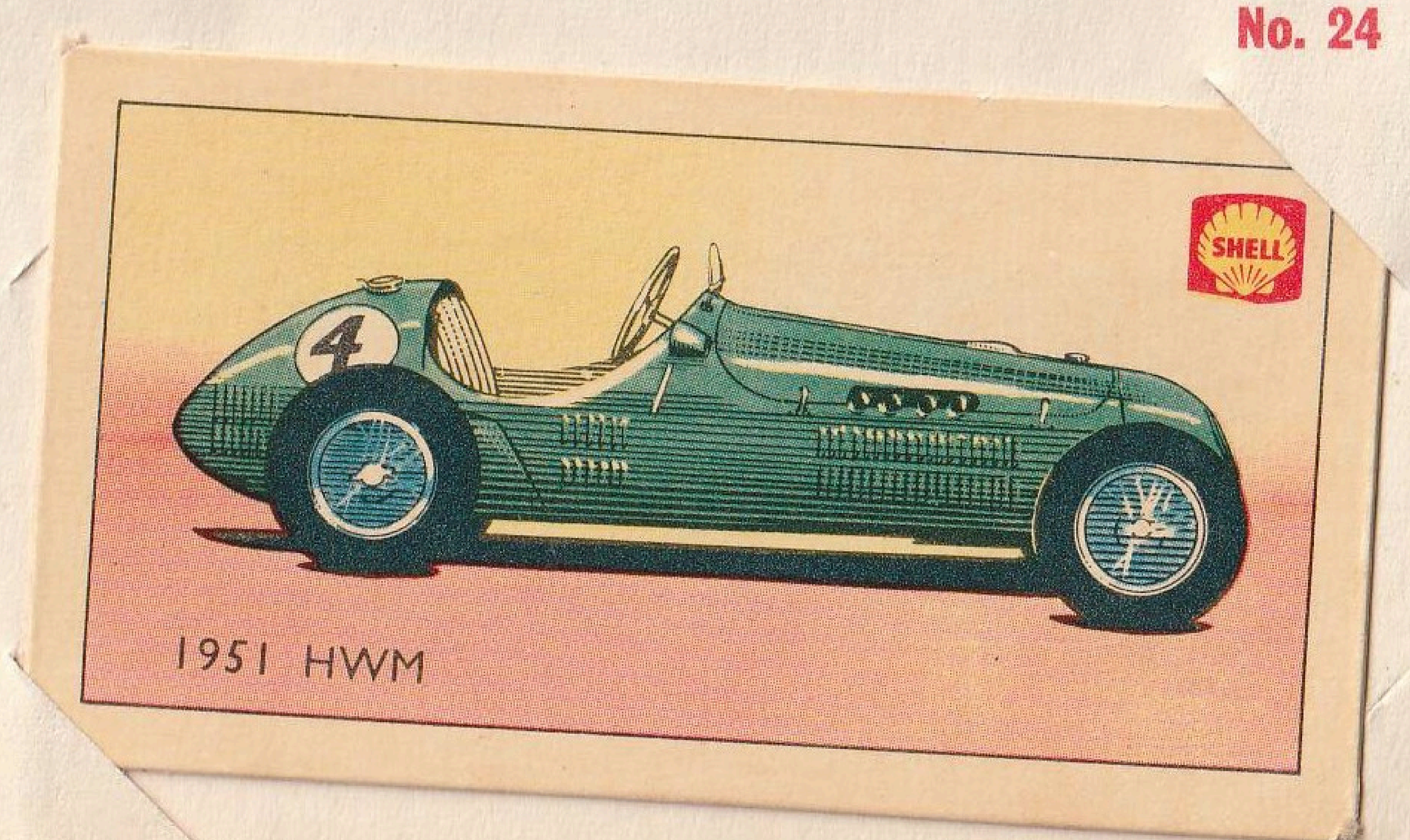


1950 LAGO TALBOT

1950 LAGO TALBOT

First appearing in 1948, this 4.48 litre, six cylinder of 93 x 110 mm made a break from the trend of supercharging with its high fuel consumption. A Wilson pre-selector gearbox was fitted directly to the engine. A train of gears then stepped the drive to the right of the driver. The car was heavy and the engine developed only 250 bhp, but because of its reliability and economy on fuel and tyres, it succeeded at times when faster, thirstier cars failed.

No. 24



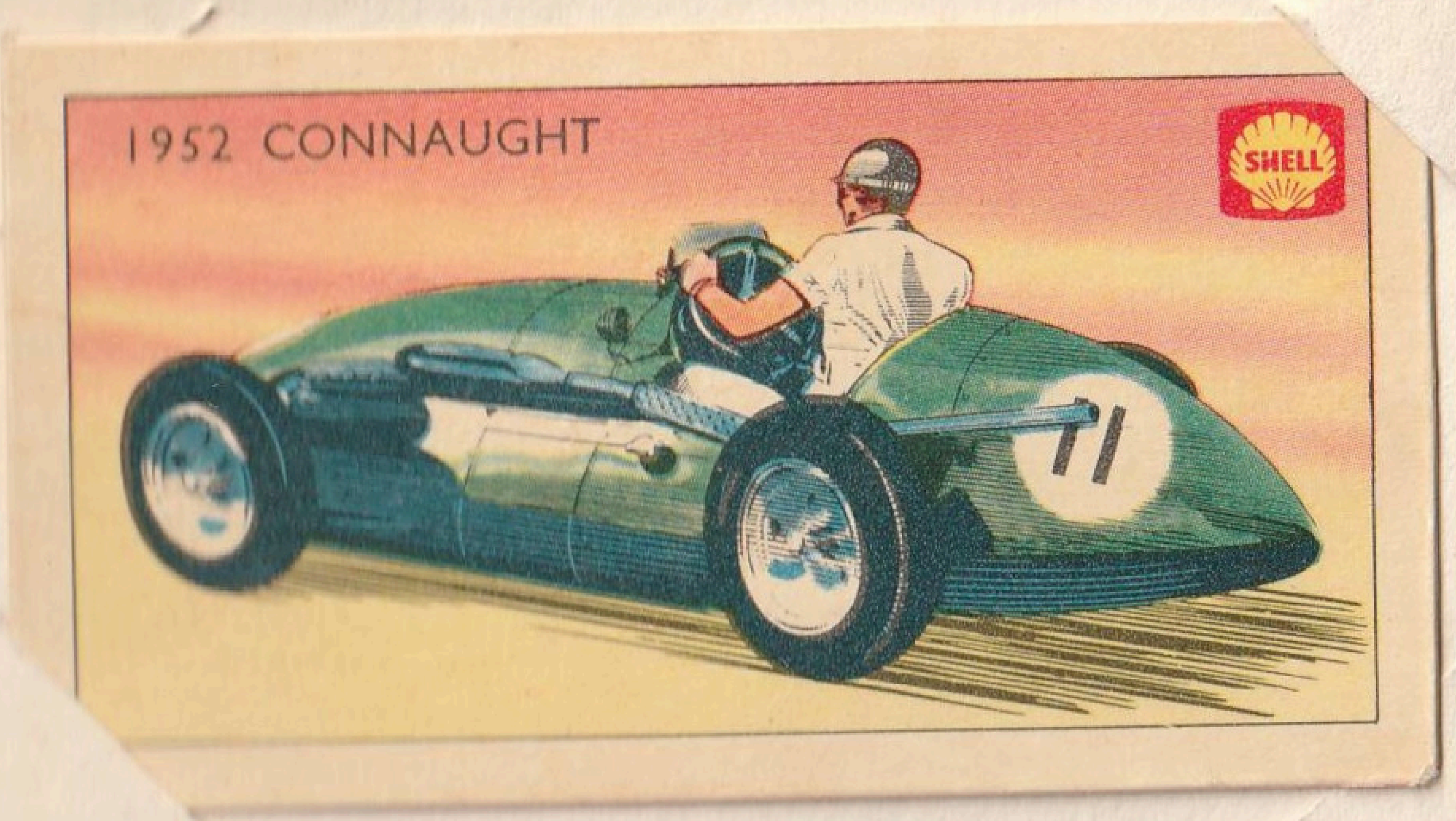
1951 HWM

1951 HWM

The initials stand for Hersham and Walton Motors where the cars were built—mostly from proprietary parts. A 1.96 litre Alta engine of 83.5 x 90 mm, developing 140 bhp was used and coupled to a pre-selector gear box. The car had all round independent suspension with wishbones and transverse leaf springs. Italy's hold on Formula II racing was seriously challenged by these cars, the 12 cylinder Ferraris often being harrassed on some circuits by the better torque of these four cylinder cars.

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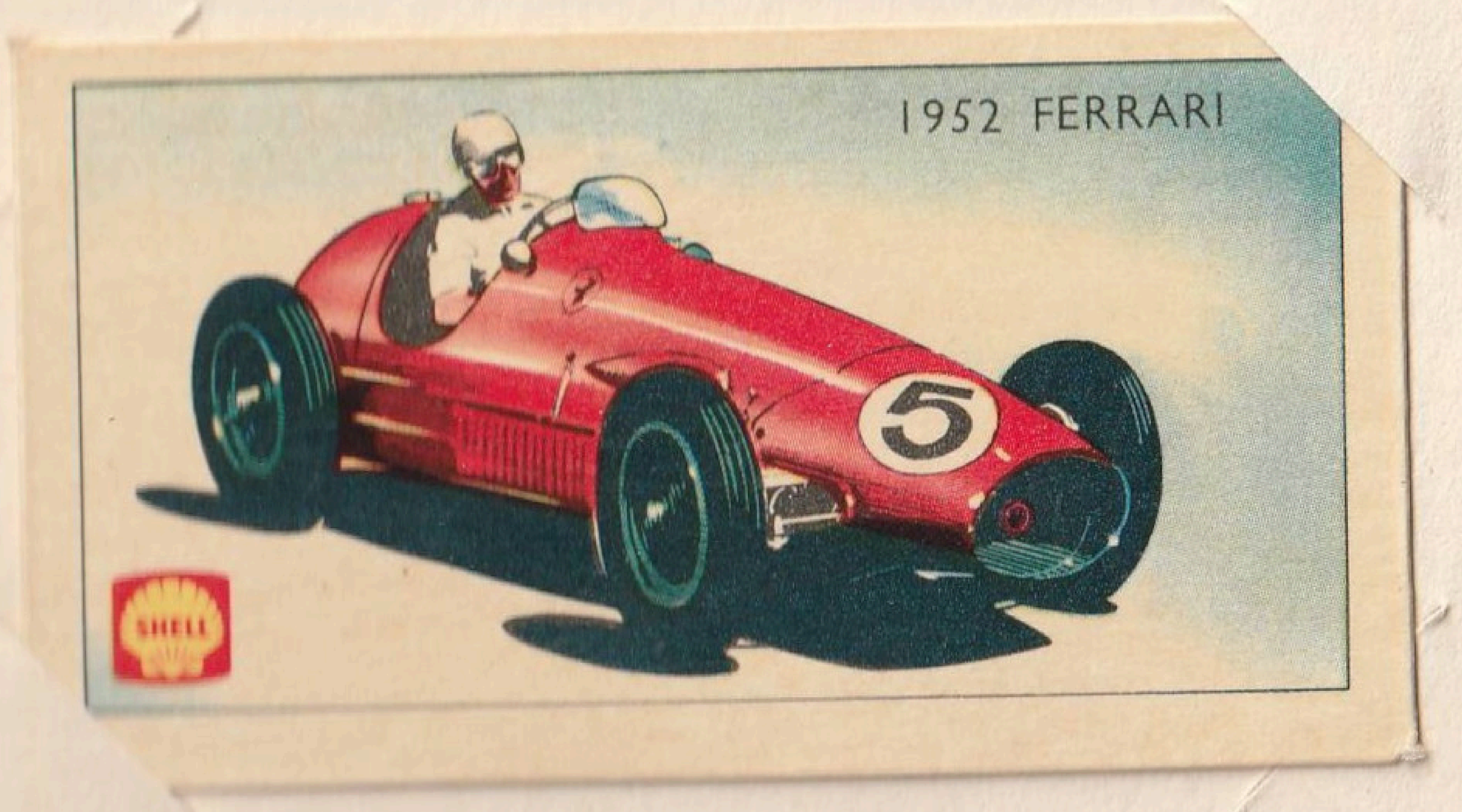
No. 25



1952 CONNAUGHT

A Lea Francis four cylinder sports car engine was used as a basis for this car. Much research was done by Connaught on gas flow problems from carburettor to exhaust tail pipe, power being improved by utilizing the pressure waves of the engine pulsations in the inlet side as well as the exhaust. Racing motor cycle experience of unsupercharged engines was utilized to a great extent and the resulting engine was fitted to a chassis with light alloy wheels and side fuel tanks.

No. 26



1952 FERRARI

The 500 Ferrari was probably the most successful Formula II car. It was built as the result of HWM pressure on the V12 Ferrari supremacy in Grand Prix racing during 1951. Ascari had many successes driving this excellent car. The 1.98 litre engine, with a bore and stroke of 90 x 78 mm had two spark plugs and a separate choke and jet assembly from the Weber carburettors for each cylinder.

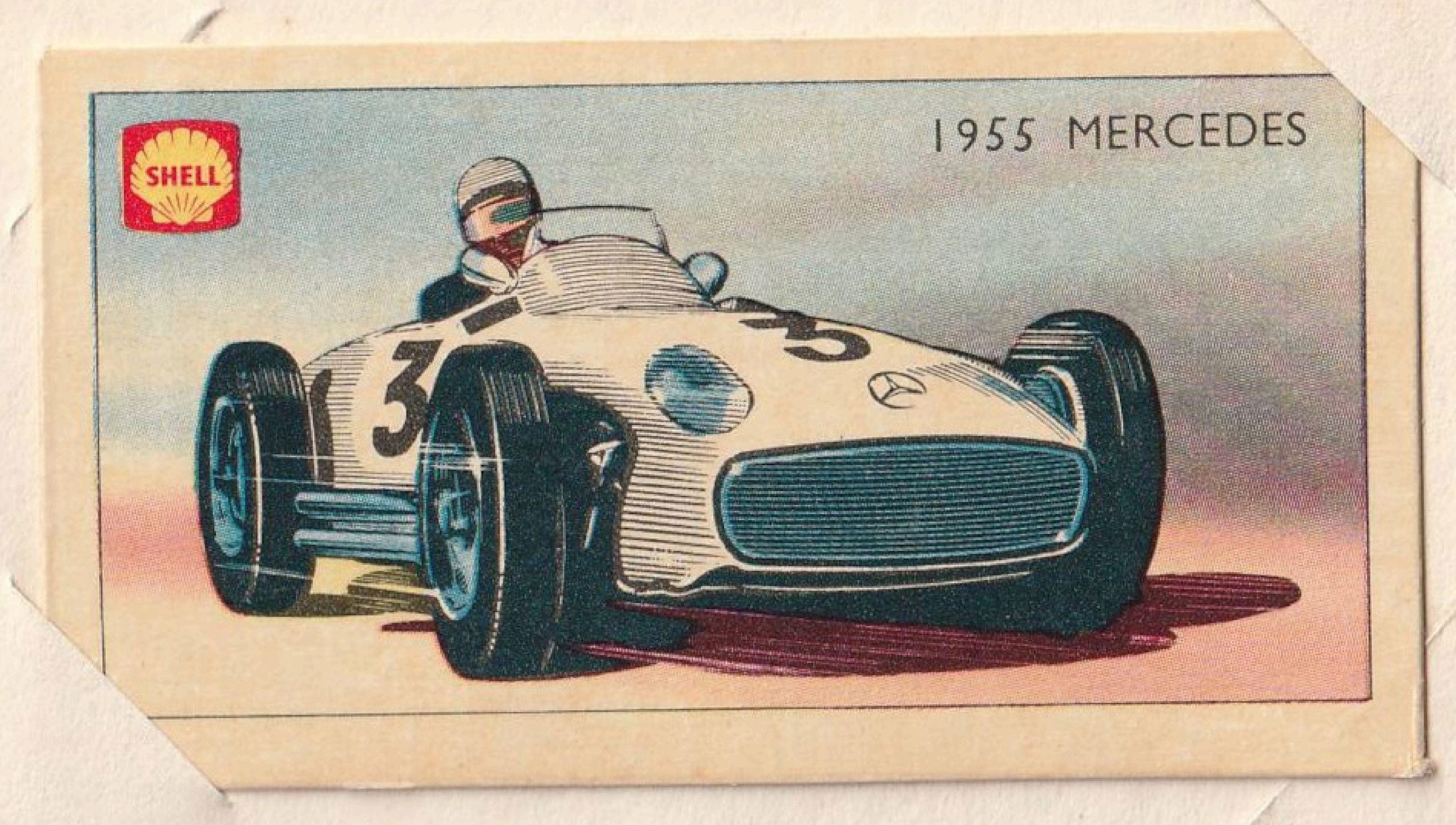
No. 27



1954 LANCIA

The Lancia D50 had a 2.48 litre V8 engine of 73.6 x 73.1 mm with twin overhead camshafts to each block. A tubular "space frame" was used with the engine forming part of the frame. Separate "pontoon" type tanks were slung on each side of the body, serving the dual purpose of keeping the difference in weight distribution between full and empty tanks to a minimum and assisting in the flow of air around the wheels.

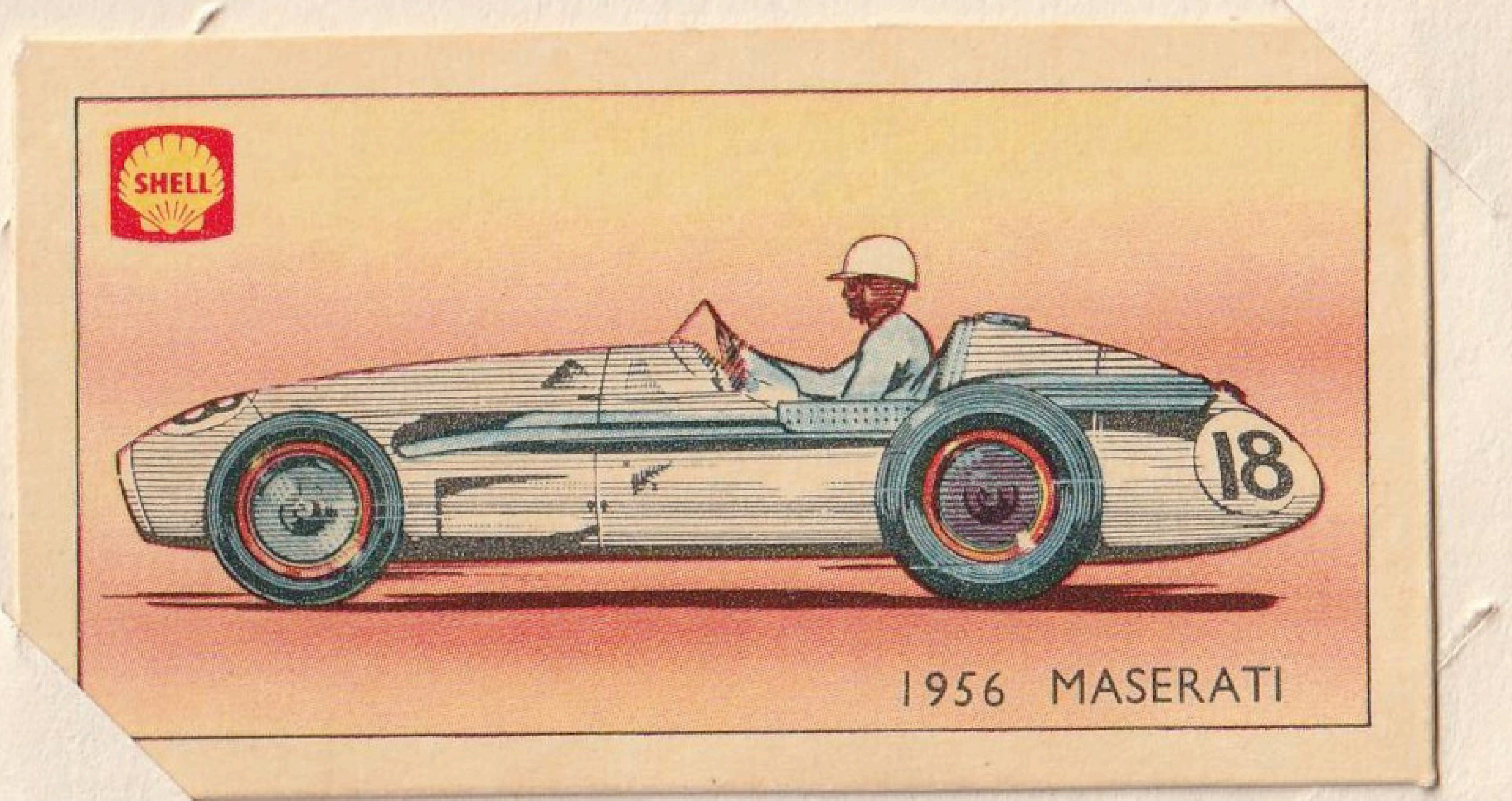
No. 28



1955 MERCEDES BENZ

The 2.49 litre, straight eight engine with twin overhead camshafts, fuel injection and springless cam operated valves was mounted almost on its side for the W196 model of 1954. As the engine was developed different bodies were used. By the end of 1955, 295 bhp was achieved and Mercedes dominated the Grand Prix field winning the first four places in the British G.P. at Aintree with less than one second between Nos. 1 and 2.

No. 29

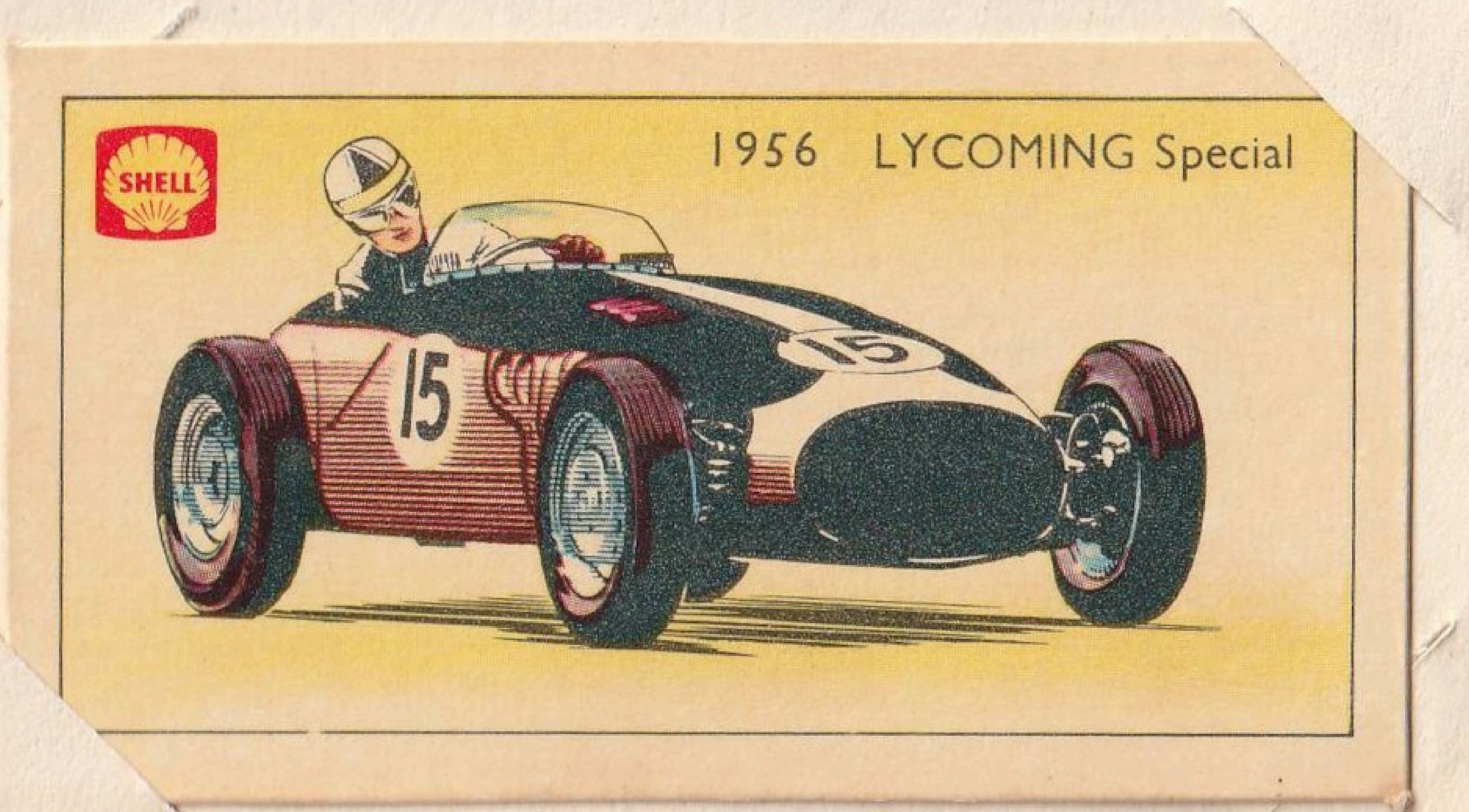


1956 MASERATI 250F

This car had a long and successful racing career. It had been driven by World Champions in European races and won the 1956 N.Z. Grand Prix at Ardmore. The six cylinder, twin overhead camshaft, 2500 cc engine produced 210 bhp at 7500 rpm giving a top speed of 160 mph on special fuel.

Ross Jensen bought the car and drove it in both the 1958 Ardmore G.P. and the Lady Wigram Trophy against top European opposition. He came 2nd and was first New Zealander home in both races. He gained three other "Firsts" in 1958.

No. 30

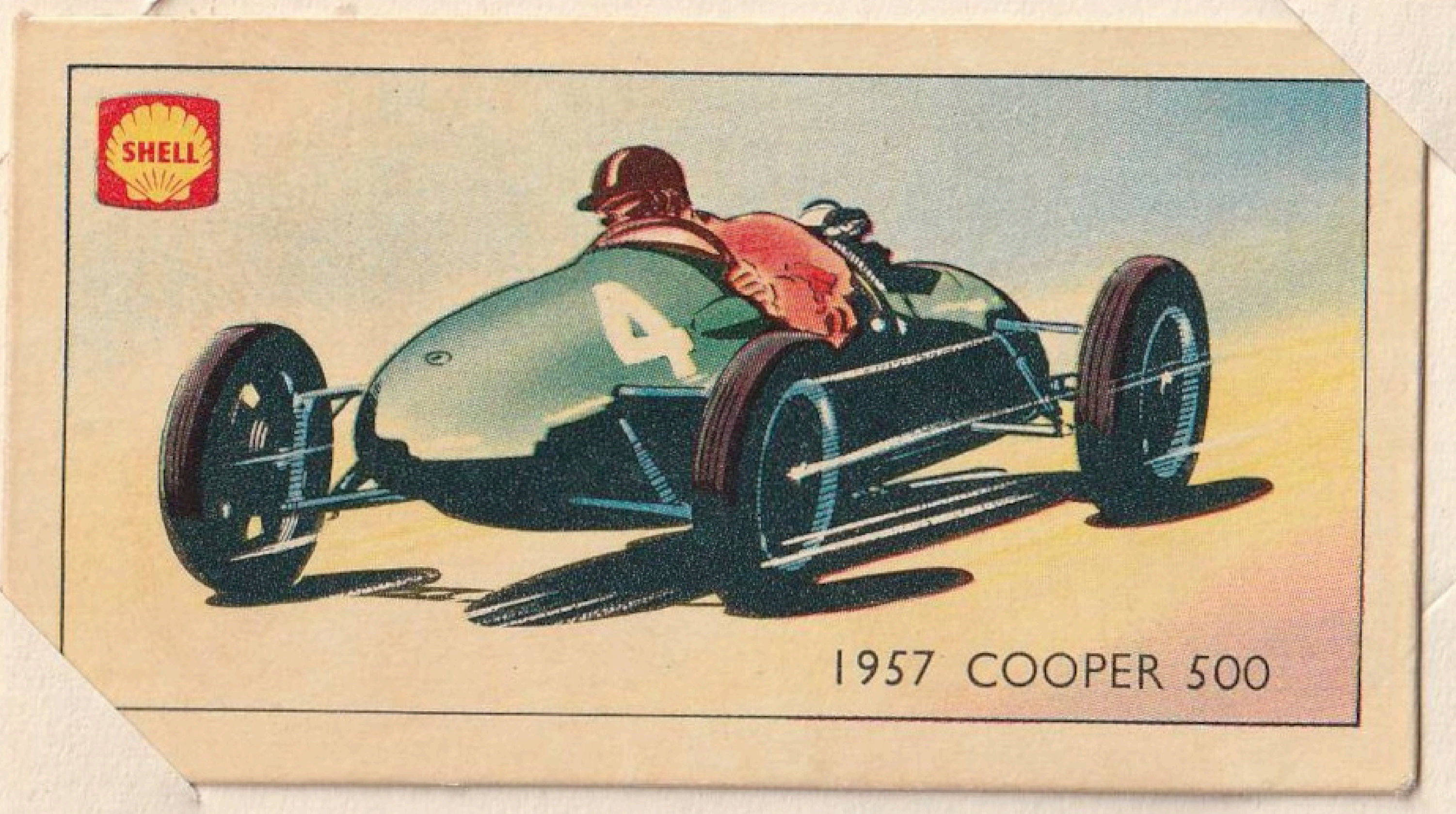


'LYCOMING SPECIAL'

This car was built in 1956 by Ralph Watson in Auckland and has been most successful in all types of motor racing, due in large measure to its fantastic acceleration. The car is powered with a 4733 cc Lycoming air-cooled aircraft engine which originally gave only about 4000 rpm. This has been increased by the use of a Chrysler 3-speed gearbox installed in reverse to step up rpm to the differential. Mr. Watson made and fitted his own fuel-injection system to replace the carburettor. Independent springing and disc brakes are fitted all round.

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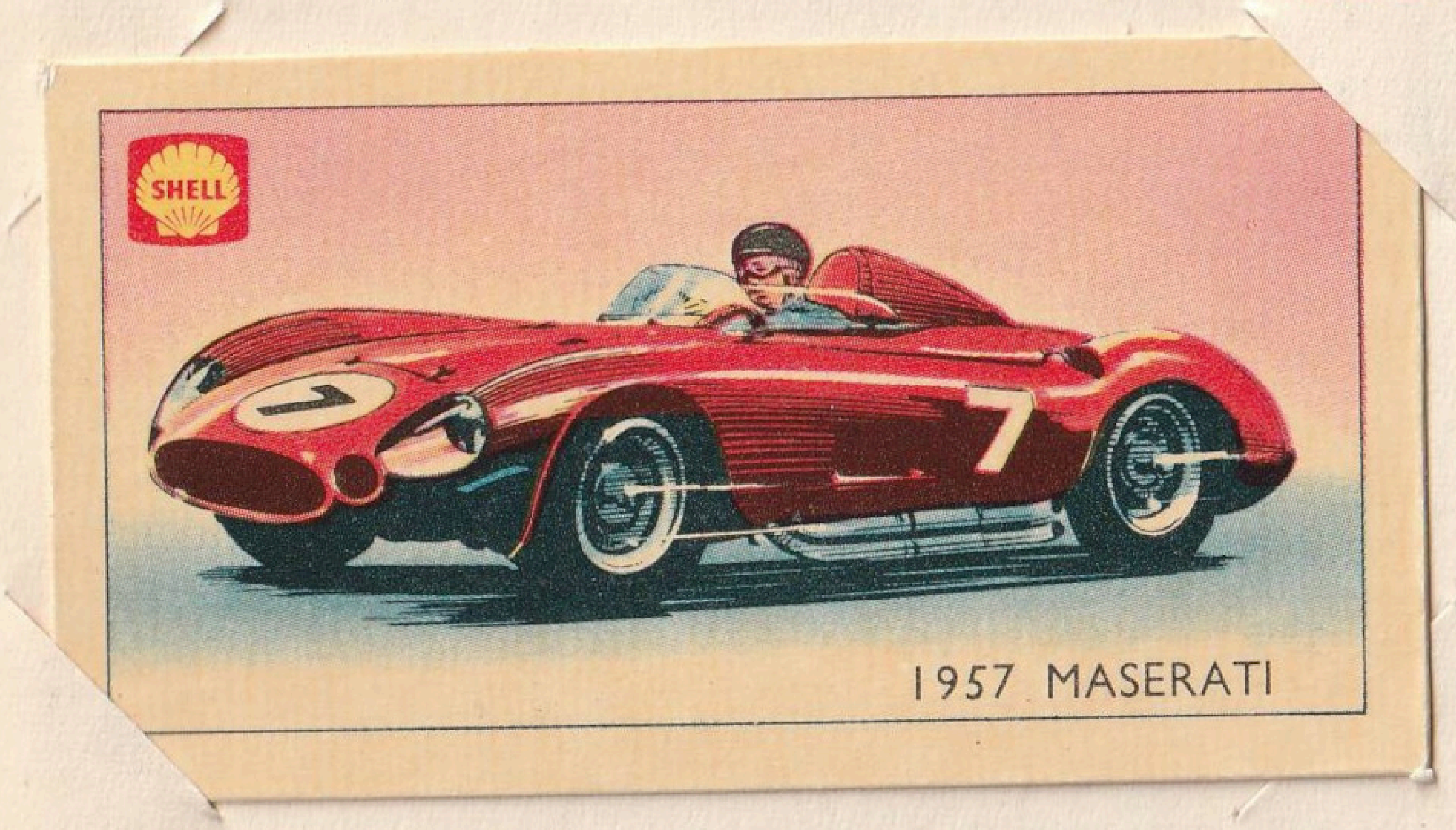
No. 31



1957 COOPER 500

Formula III racing was for cars with an engine size up to 500 cc and motor cycle engines were normally used. The English firm of Cooper was established expressly to build these cars, which were so successful that they monopolised this form of racing completely. The cars put up terrific performances for their size. For comparison, the 1957 lap record for Goodwood was 95.79 mph in a Maserati while 500's were lapping regularly at 84 mph.

No. 32



1957 MASERATI 300S

This model had a 3 litre, six cylinder engine with a four-speed gearbox which was fitted as part of the rear axle final-drive unit and extended to the right of the differential. P. Taruffi, old enough at the time to be the father of most top racing drivers, driving a 300S in the Giro di Sicilia, crashed into a house with barely 100 miles to go. He spent ten minutes straightening up the steering, and pressed on to come in second. His average speed was 104.3 kph for 10 hours 20 minutes.

No. 33

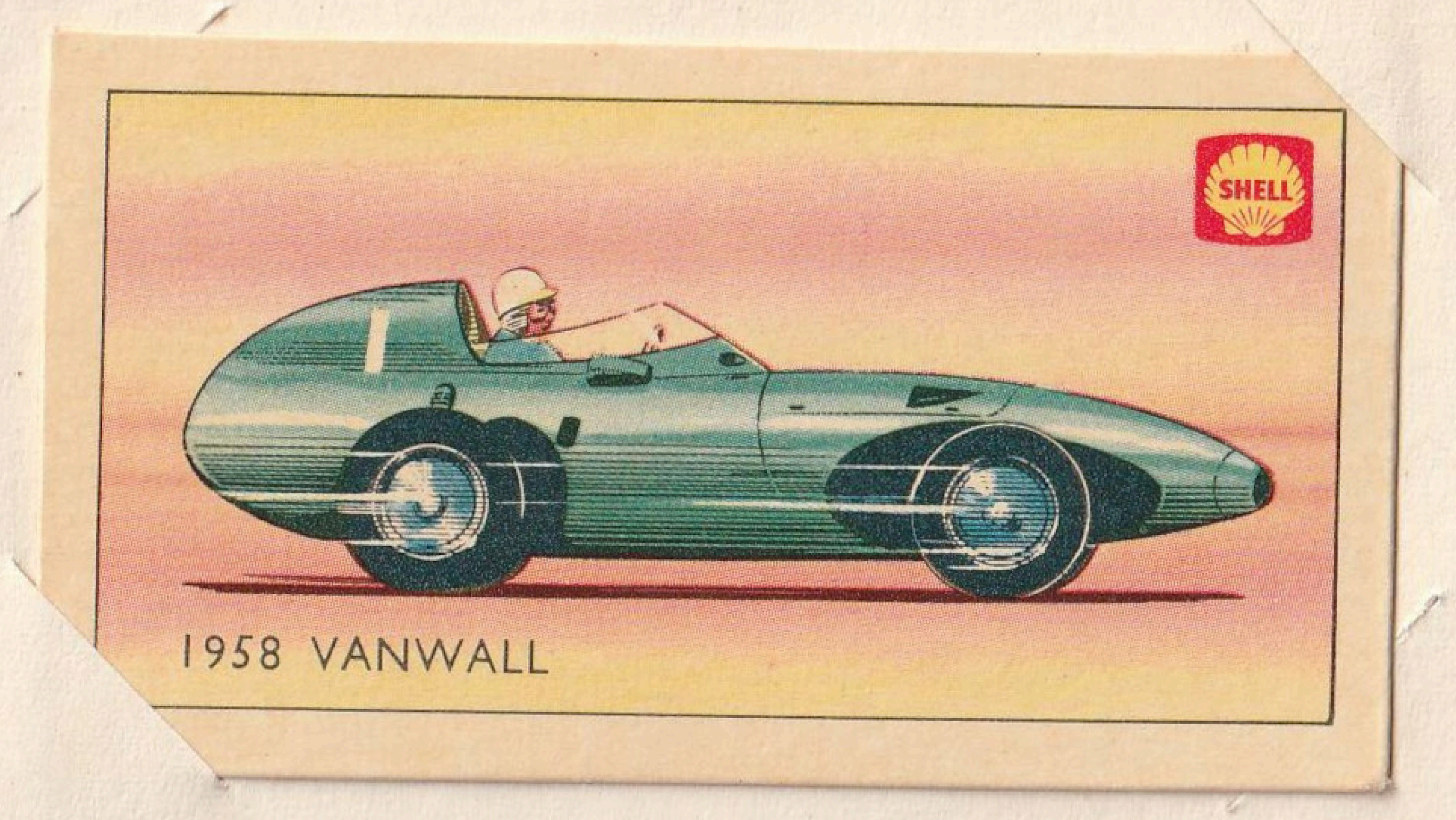


1957 LISTER JAGUAR

The Lister Jaguar won many sports car races, although strictly speaking it was a Racing/Sports car — a type of car that is really a thinly disguised Grand Prix machine with a larger engine than most G.P. cars. To meet regulations such as those at Le Mans, it carries a second seat and certain touring equipment such as hood, starter, battery, lamps and spare wheels.

The Lister was powered by the 3.8 Jaguar engine giving a power/weight ratio of over 350 bhp per ton.

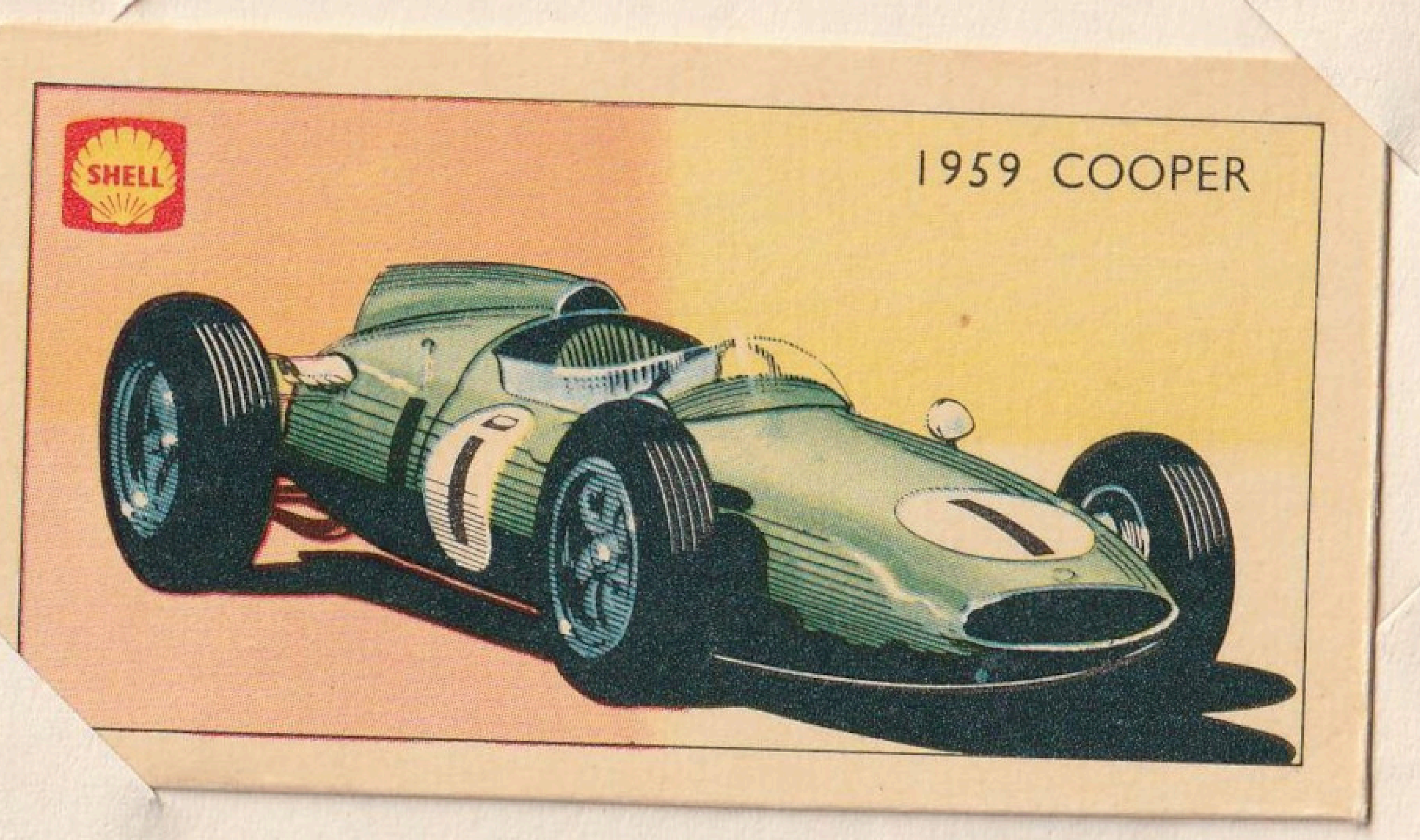
No. 34



1958 VANWALL

The year 1958 was the Vanwall's year of glory. In spite of many retirements early in the year, the marque won the Dutch Grand Prix at Zandvoort, the Belgian Grand Prix, the German Grand Prix at Nurburgring, the Portuguese and Italian Grands Prix as well as the Grand Prix Automobile des Maroc at Casablanca — a total of six G.P.'s in a season, with one 2nd, two 3rds, one 4th and one 7th. Not only was this Vanwall's greatest season but it was Britain's best G.P. year since the early 1920's.

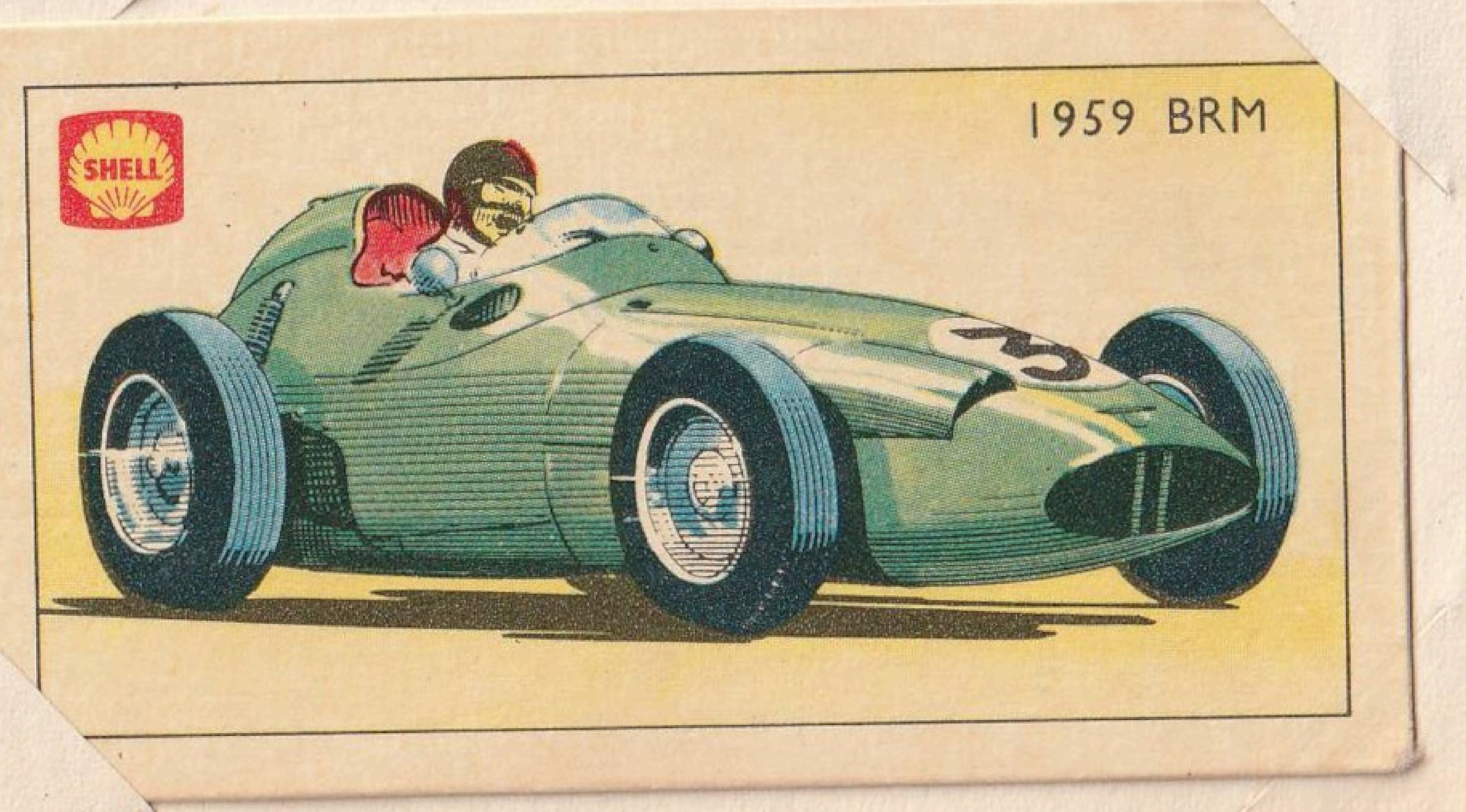
No. 35



1959 COOPER

This 2½ litre G.P. car started the swing over to rear engines and to very compact designs. It was a result of building from components of many specialist firms. Powered by a Coventry Climax four cylinder engine giving 235 bhp at first, it proved very reliable and was successful in 1959 in winning the Manufacturers' Championship. Cast alloy wheels were used in the search for greater strength and lighter weight than the conventional wire wheel.

No. 36



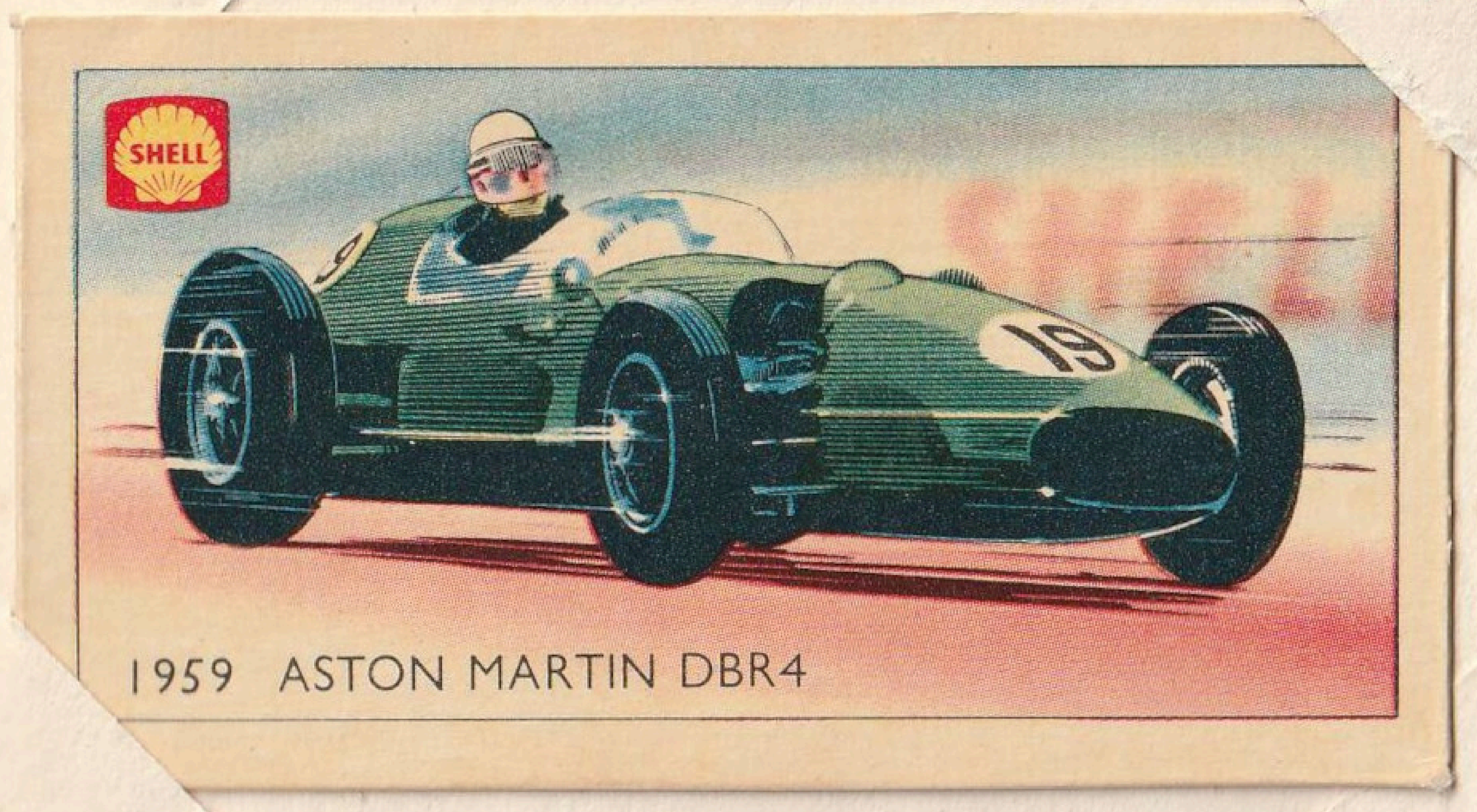
1959 BRM

By 1958 the BRM had undergone tremendous development. Suspension had changed first from air struts to transverse leaf springs and then to coil springs, and it had become one of the most roadworthy cars.

In 1959 Ron Flockhart won the Wigram Trophy in a BRM and later that year BRM won its first Grand Prix — the Dutch G.P. Towards the end of the year the old front-engined BRM gave way to a modern rear-engined version.

RACING CARS OF THE WORLD

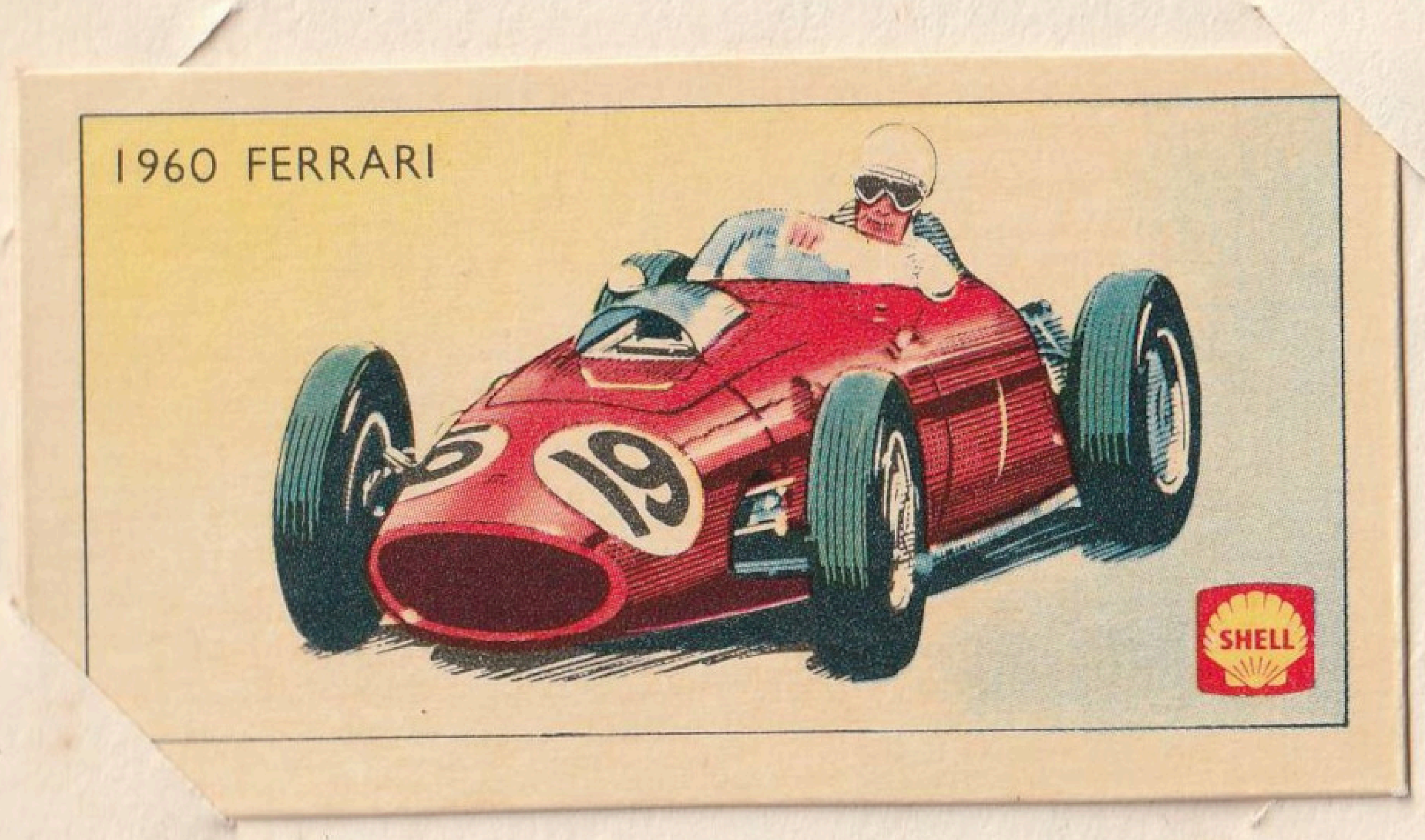
No. 37



1959 ASTON MARTIN DBR 4/250

In 1959 Aston Martin Sports Cars (DBR 1/300) came first and second at Le Mans and first in the 1000 km at Nurburgring. Then for the first time since 1922, when Count Zborowski and Clive Gallop drove Aston-Martins to victory in G.P. racing, an Aston-Martin — the DBR 4/250 — entered the Grand Prix field. In its first race at Silverstone, the G.P. Aston Martin came second in the BRDC International Trophy race. The engine, a six cylinder twin-cam, was mounted in a light tubular space frame. The car was rather large but beautifully built.

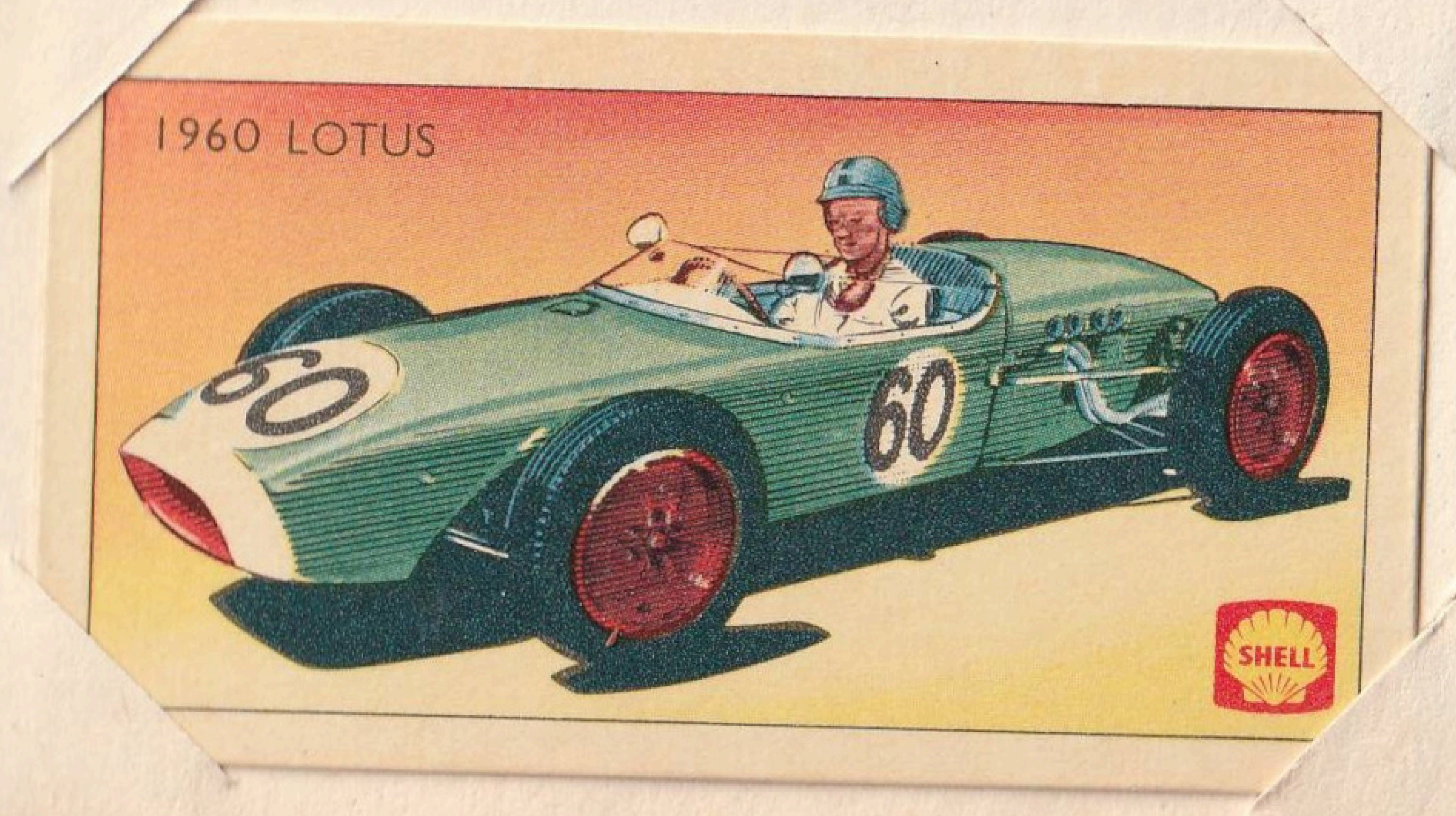
No. 38



1960 FERRARI

This Ferrari FL is the car with which Pat Hoare, N.Z. Champion Driver for 1961/62, has achieved so many successes. The V12, 3 litre engine is of aluminium alloy with wet sleeves, twin overhead camshafts and six double choke carburettors. It has a five speed gearbox and there are nine optional final drive ratios, giving maximum speeds between 135 and 178 mph at 8000 rpm. Pat Hoare drove the Ferrari to victory in the Marlborough and Festival Road Races and in the Ohakea Scratch Race.

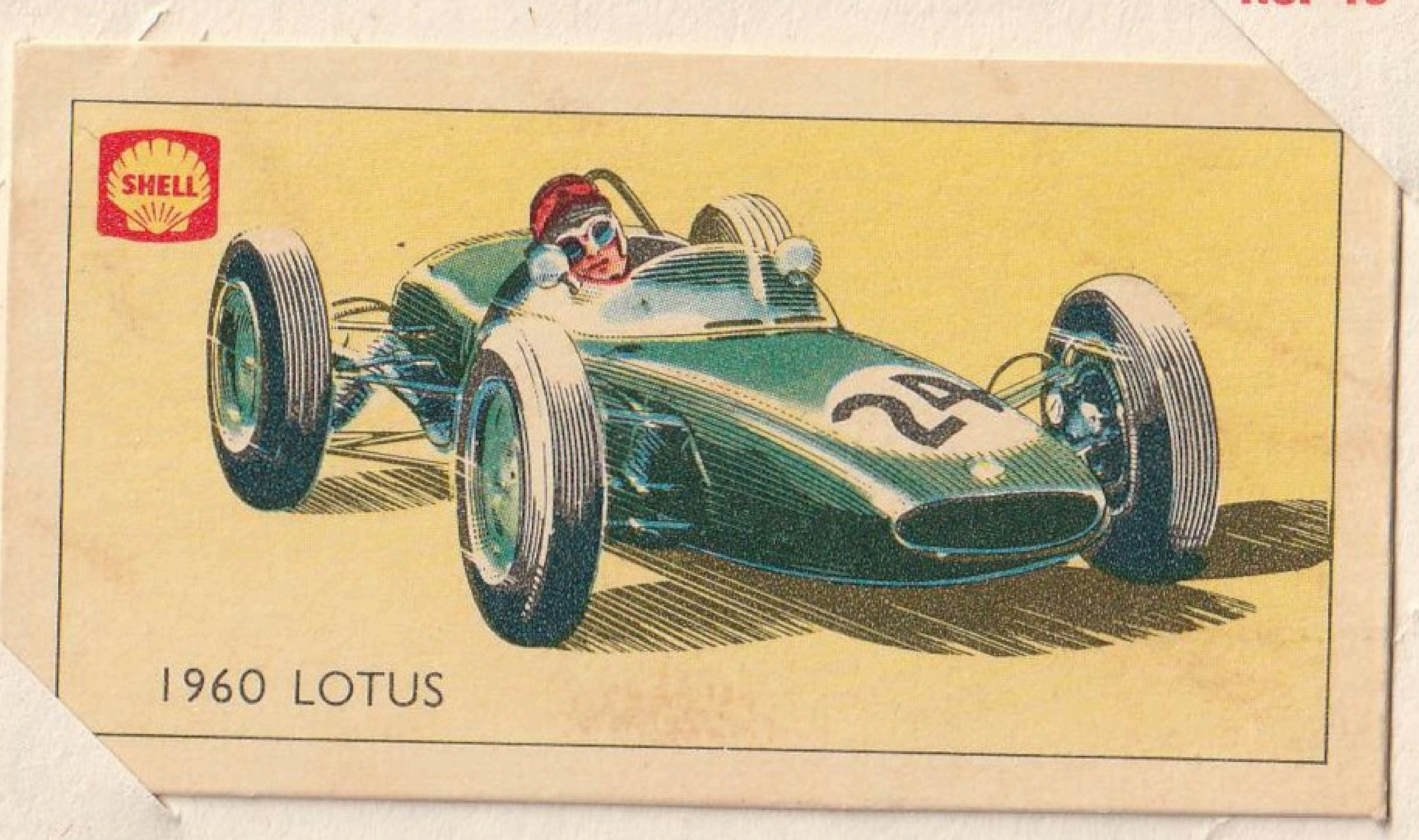
No. 39



1960 LOTUS

This car, in 1100 cc form, was raced by the Team Lotus in Europe and proved to be the fastest Formula Junior car in the 1960 season. It now has a 1475 cc engine built from Ford components but enlarged and modified to give 118 bhp at 6500 rpm — about three times the original engine's horse power. The gearbox is VW, turned upside down. The car weighs about 8½ cwt and has a top speed of 135 mph depending on the gear ratios chosen. Disc brakes provide excellent stopping power.

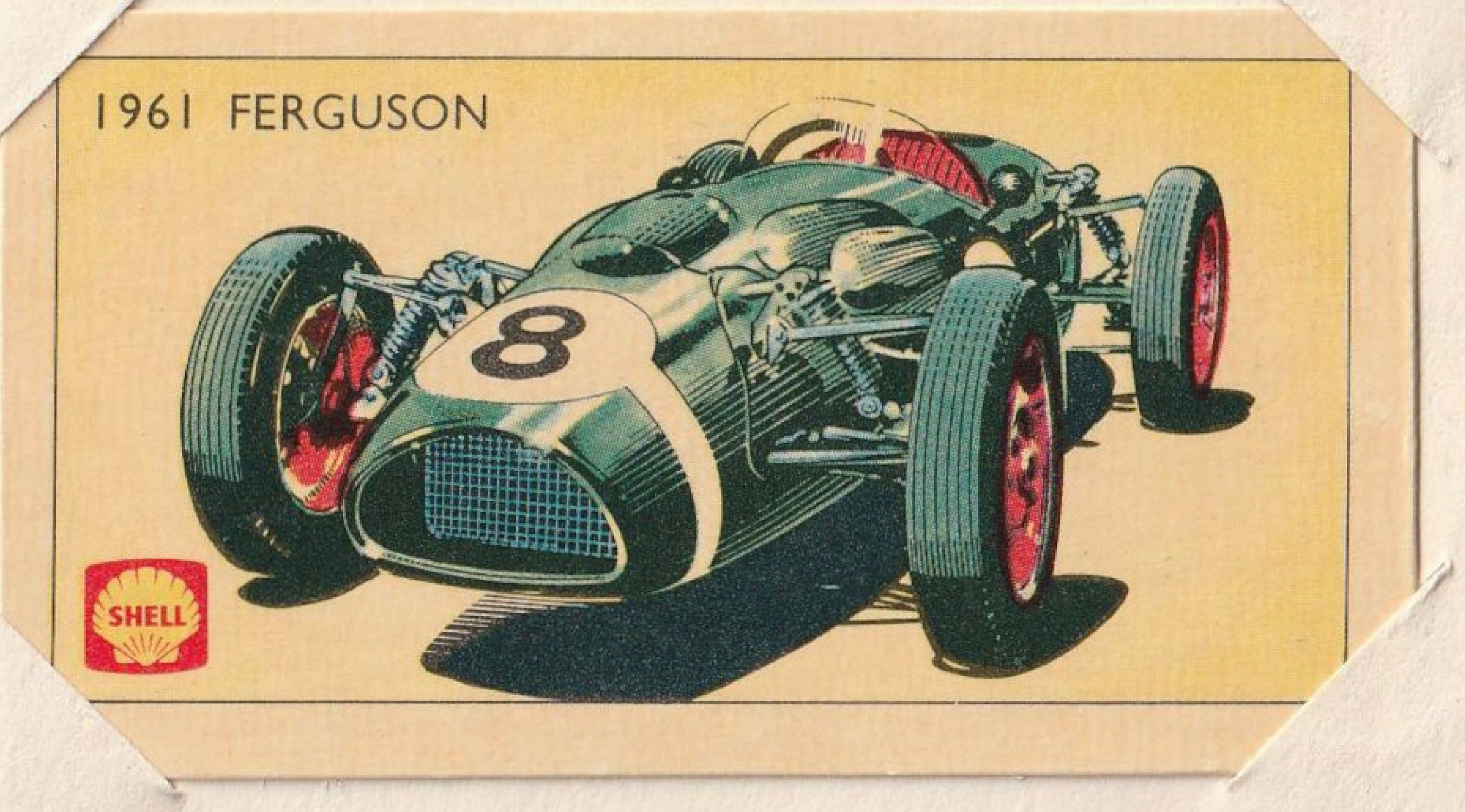
No. 40



1960 LOTUS CLIMAX

This car used the earlier four cylinder Coventry Climax engine which was 2495 cc, 94 x 89.9 mm giving 240 bhp at 6750 rpm on "straight" petrol. It had a very light space frame chassis with the fuel tank in the nose and a five speed gearbox. The idea of five speed gearboxes is to give the driver a gear for starting off and four then to be used throughout the race. Weight of the car was 9½ cwt. It won the 1960 Monaco Grand Prix.

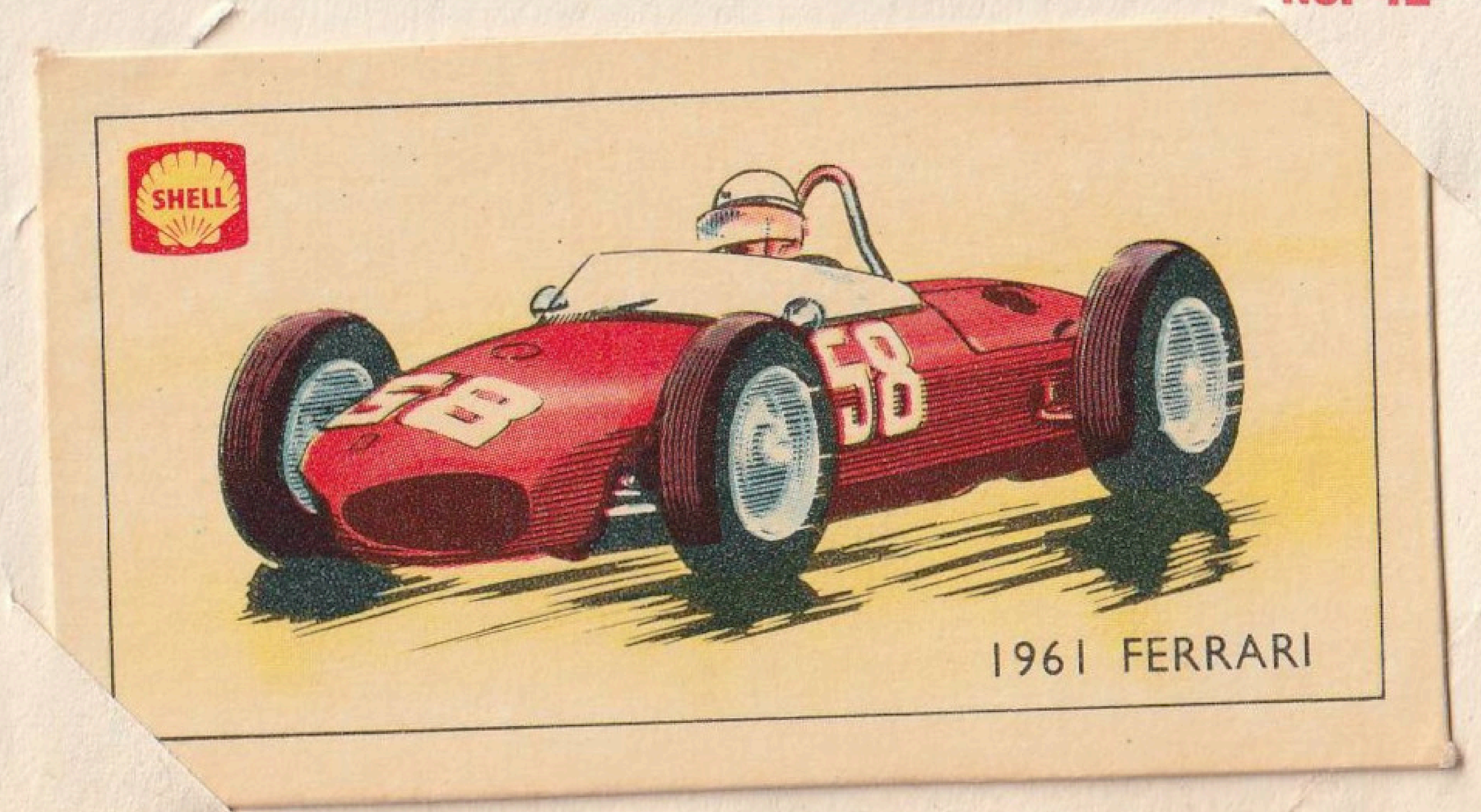
No. 41



1961 FERGUSON

Built partly as a mobile test-bed for the Ferguson principles of four-wheel drive, with a master differential and the Dunlop Maxaret device to equalize power and braking effort at all times the Ferguson is completely unorthodox among G.P. cars. Unlike almost all present day racing cars, the engine, a Coventry Climax unit, remains at the front. With complete freedom from wheelspin on any wheel and with no fear of locking wheels on braking, the car should give drivers considerable advantages.

No. 42

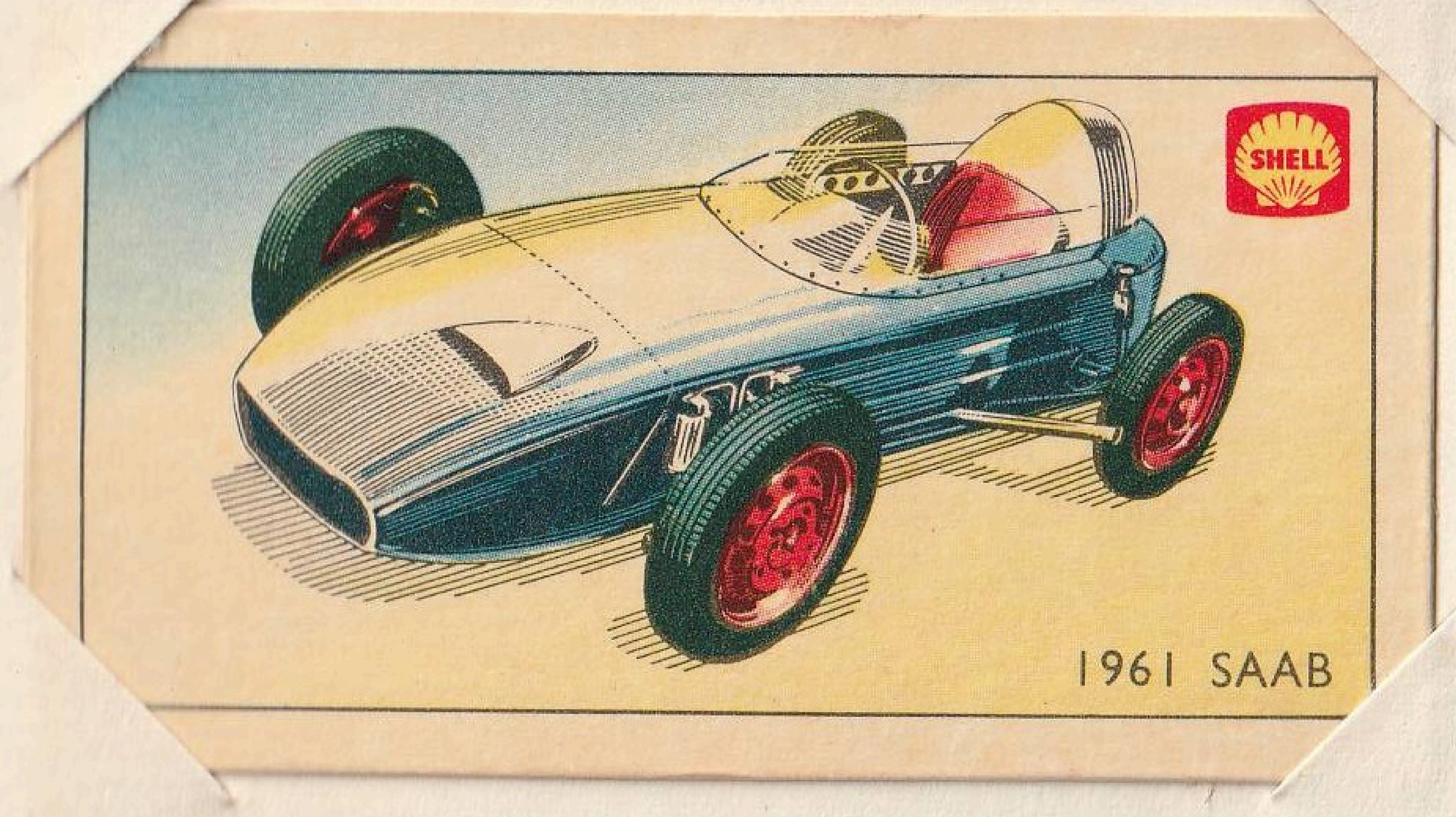


1961 FERRARI

To meet the 1961 Formula 1 regulations, Ferrari reduced the engine size of the highly successful V6 Dino engine from 2½ litres to 1½ litres. This engine had four camshafts, driven by roller chains, and three carburettors in the vee of the engine. The design of the car followed the lead set by the Cooper Climax in having the engine at the rear and forming part of the space frame chassis. Peak power was developed at 9500 rpm and various figures, ranging from 171 bhp to 190 bhp, have been quoted.

RACING CARS OF THE WORLD

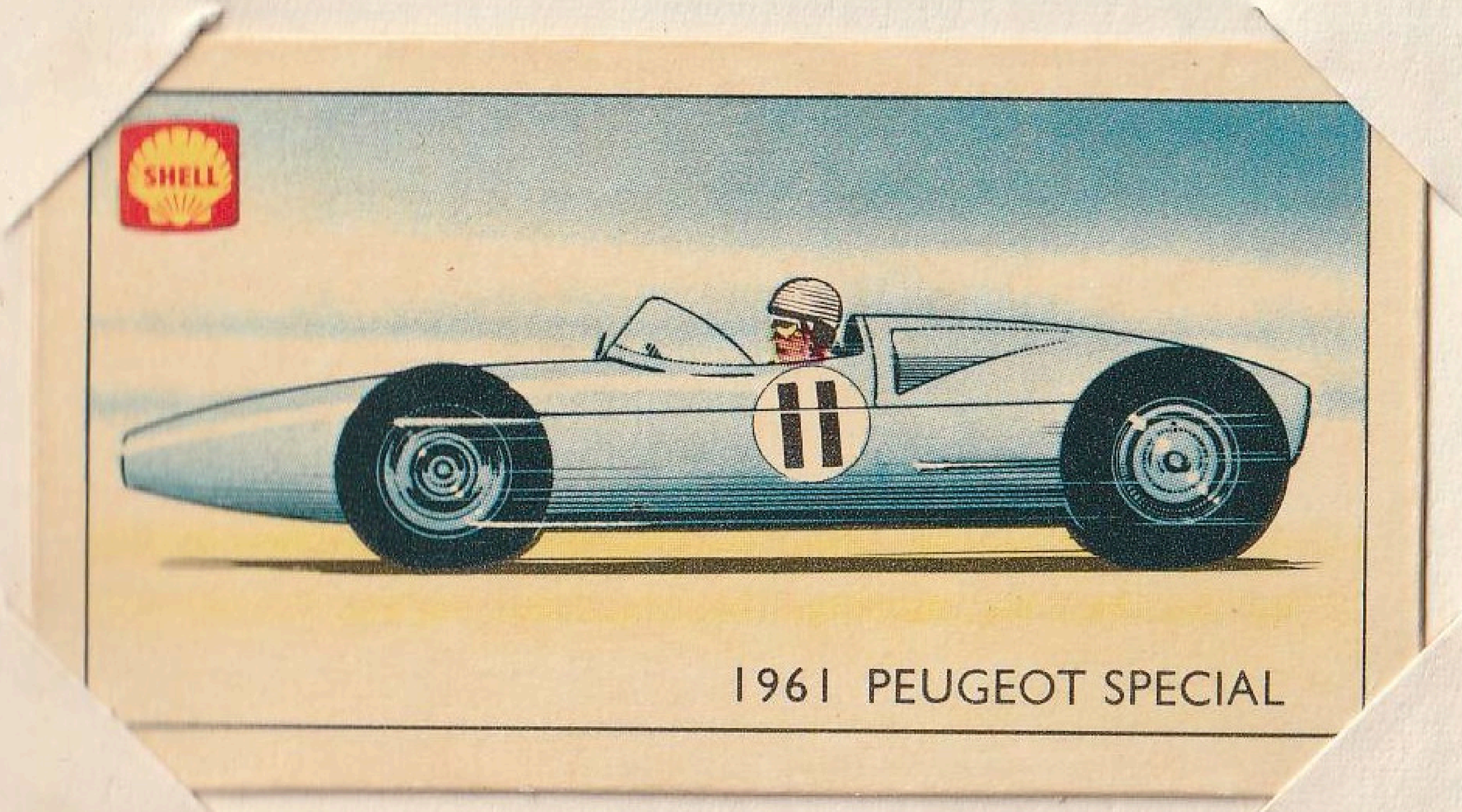
No. 43



1961 SAAB

The prototype of this unusual Swedish Formula Junior car was equipped with a three cylinder, two-stroke engine of 850 cc and front wheel drive. Standard SAAB transmission, rear axle and brakes are used, and the engine is tuned to give 70 bhp. The steel body is of stressed skin construction; nose and tail units are of fibre glass. There is no separate load bearing structure. The total weight is only 840 lb of which the shell accounts for a mere 97 lb.

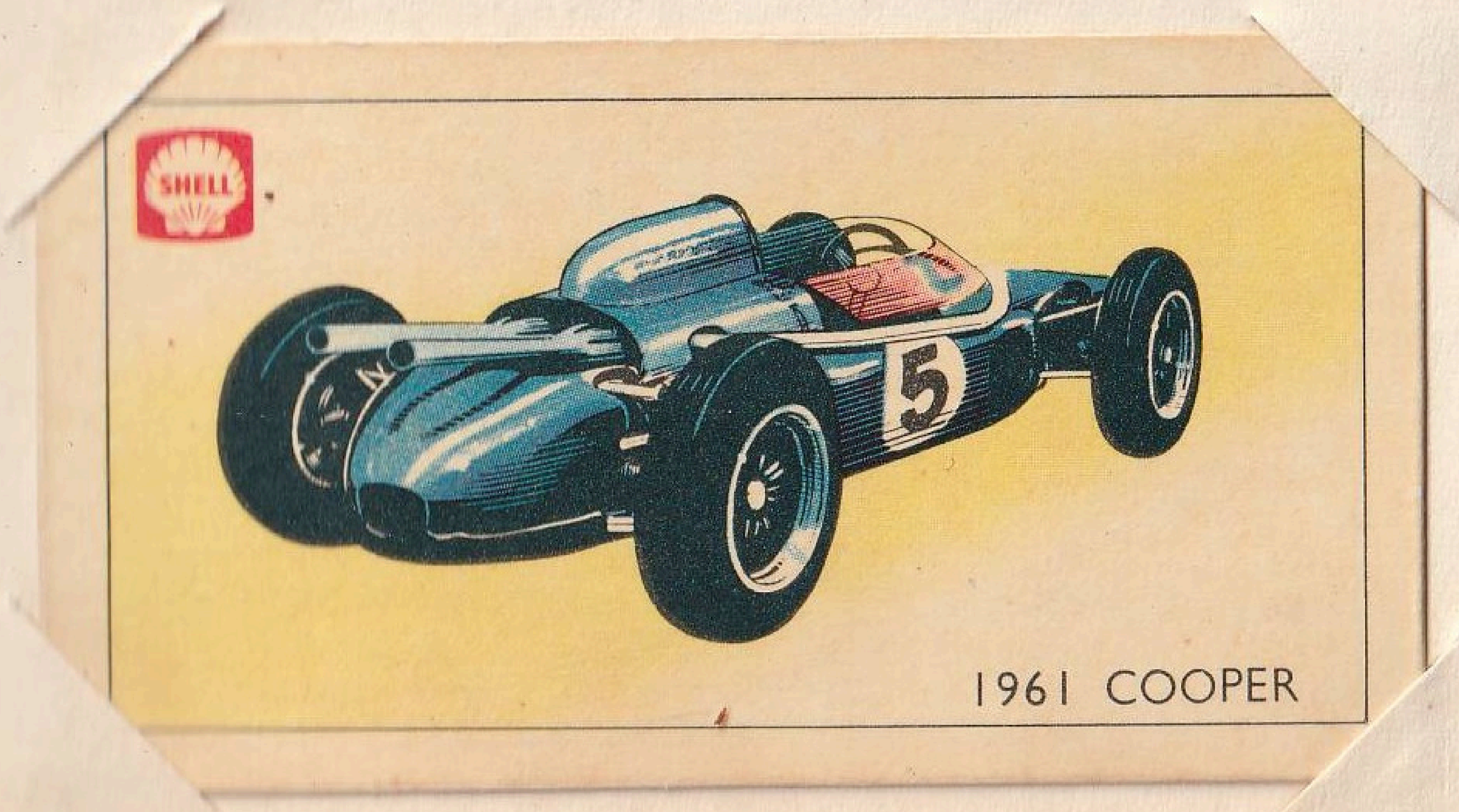
No. 44



1961 PEUGEOT

This West Australian Special, a Peugeot engined Formula Junior car, uses a '203' motor, later to be sleeved down to only 1000cc, and has 4 small carburettors. Various other pieces come from a Fiat 500, Volkswagen, 1927 Plymouth, Ford V8 and a Renault 750! Beautifully made, the car handles extremely well, and in 1961 Wally Higgs who owns and races it, became Under 1500 cc State Champion. The car is 11 feet long, 29" high and has 3" ground clearance.

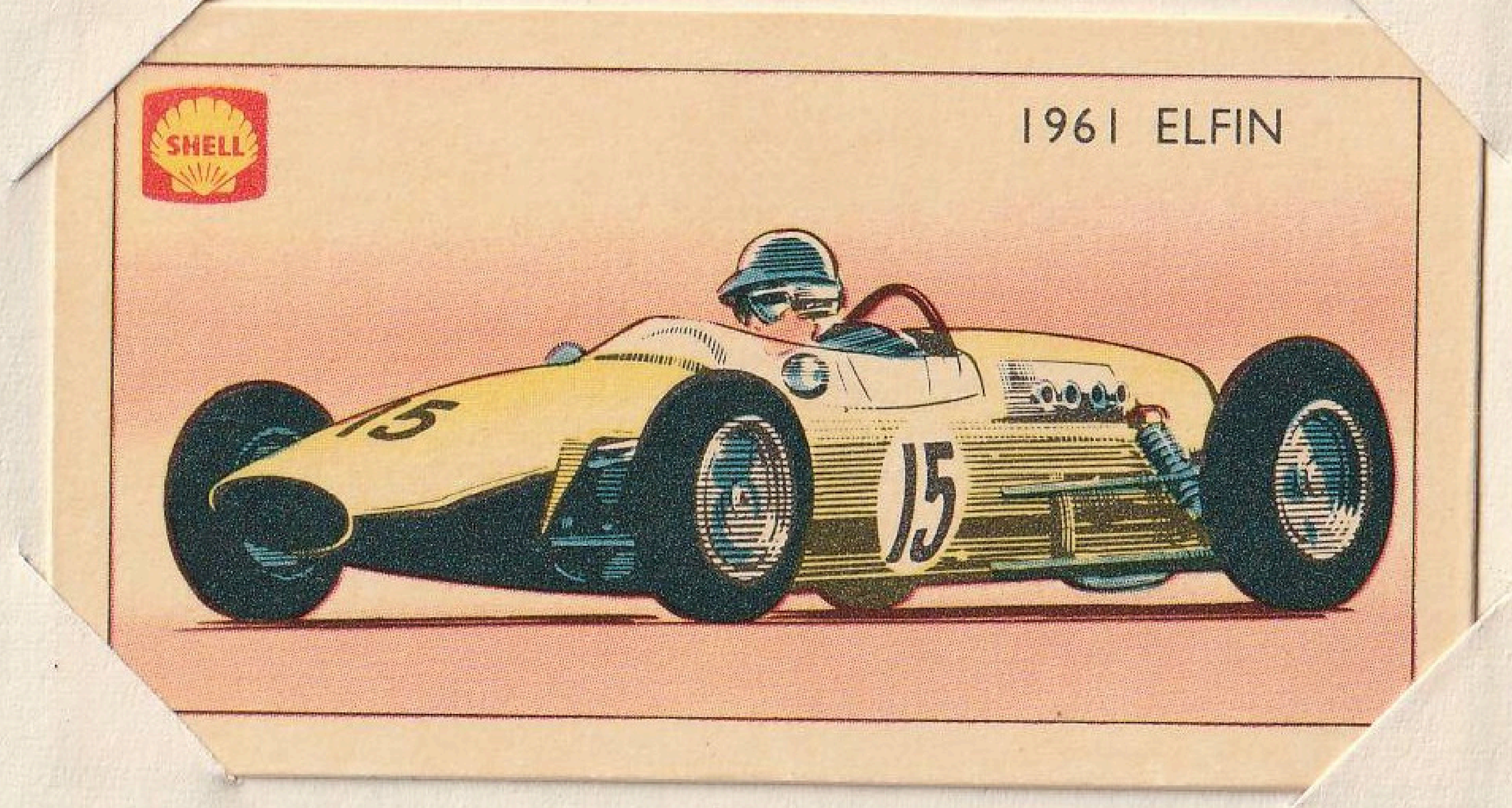
No. 45



1961 COOPER

The Cooper is powered by the V8, 63 x 60 mm, 1500 cc Coventry Climax engine and delivered 174 bhp at 8600 rpm when first developed. Exactly one week from delivery of the engine to the Cooper works, the car was putting up the second fastest time in practice laps at Nurburgring for the G.P. of Europe. The design of the exhaust system is very complicated and the appearance of the two megaphone pipes must be disconcerting to drivers positioned behind the Cooper on the starting grid.

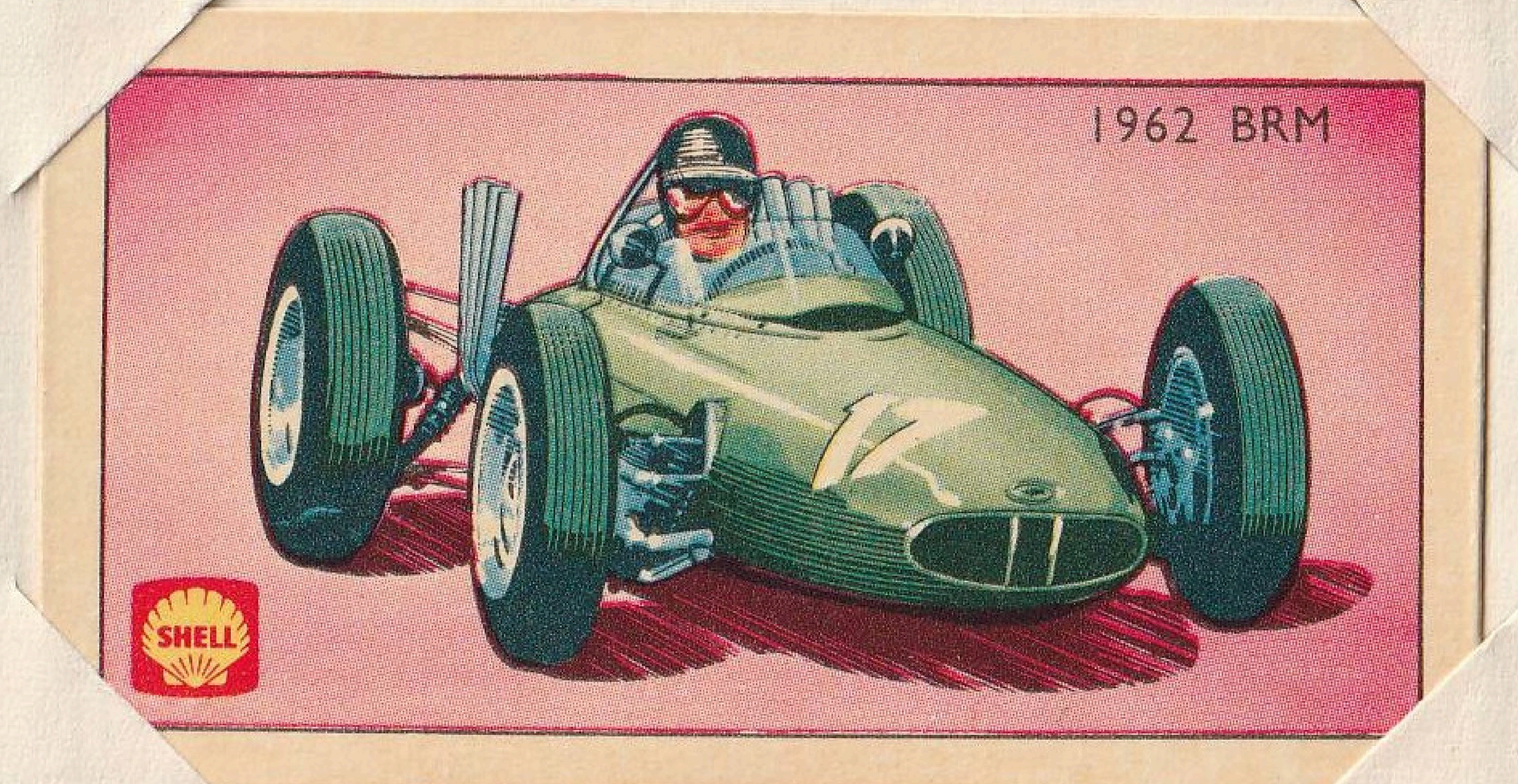
No. 46



1961 ELFIN

This Australian Formula Junior car follows the Lotus Twenty fairly closely. Shown at the Melbourne Racing Car Show in August, it raced for the first time in September. It uses a Cosworth converted Ford 105E (Anglia) engine. It has a multi-tube space frame and drum brakes are used all round, with cast lightweight alloy wheels. A second car was completed with a sleeved Peugeot engine, and the car is now available with various other engines as required.

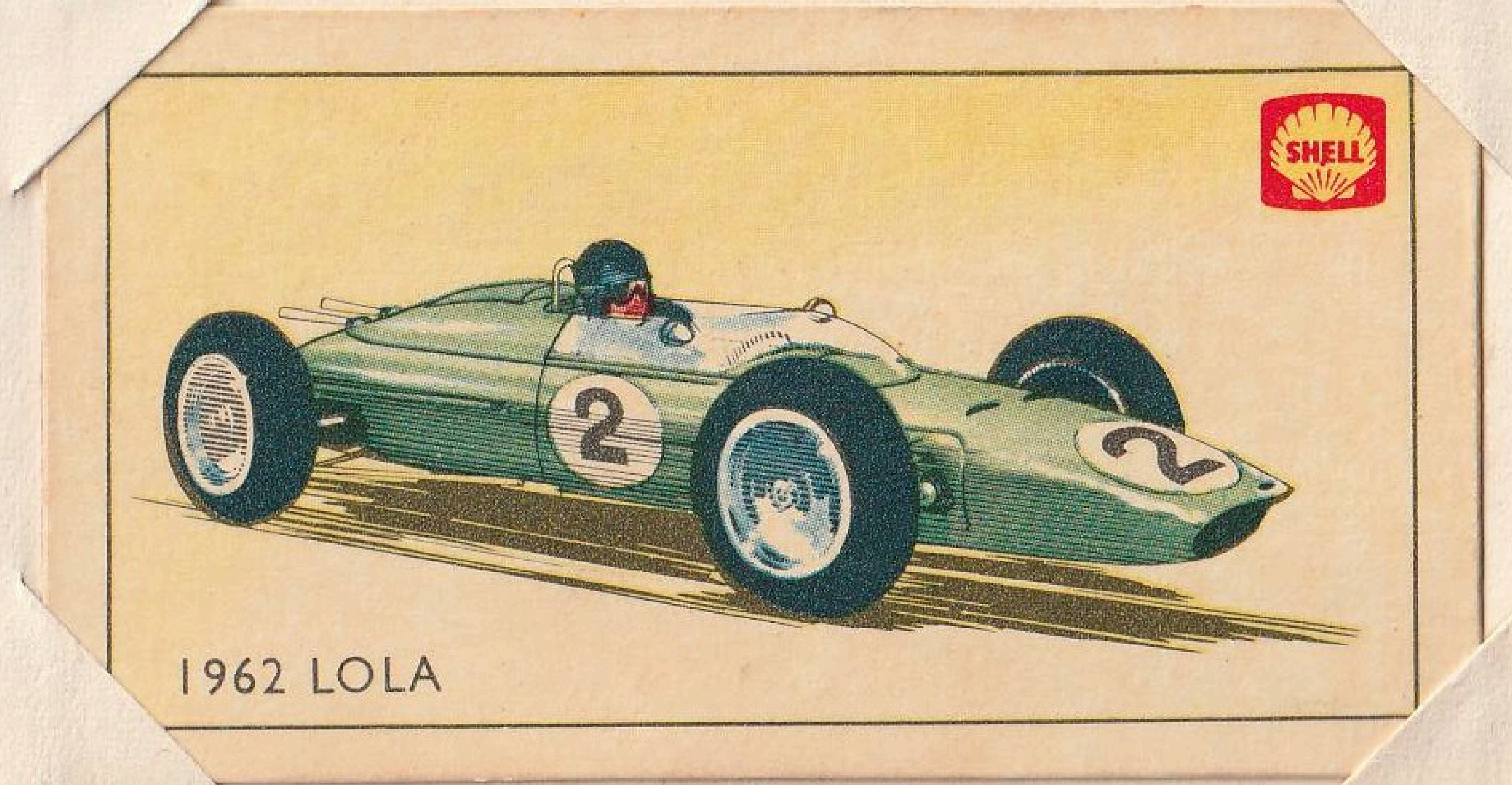
No. 47



1962 BRM


British cars staged a magnificent return to winning form in the European Grand Prix at Zandvoort in Holland — the first G.P. of the 1962 season. Graham Hill in a BRM led for 68 out of the 80 laps and won the race with a 27 second lead over another British car, the V8 Lotus. Although similar in appearance to the 1960/61 BRM, the engine is now a V8 of BRM design and the chassis has been altered considerably, particularly in the rear suspension. Disc brakes are fitted all round.

No. 48



1962 LOLA

The Lola packs all components (including the driver) into the smallest possible space. The driver is fitted into a moulded glass fibre seat, his legs pass through a small hole in the bulkhead to reach the pedals, the battery is just below his knees. Water from the radiator at the front passes through the frame tubes to the rear engine. Oil, within plastic tubes, is carried in the same way. The engine is the Coventry Climax V8 engine of 63 x 60 mm of 1494 cc delivering 174 bhp at 8,600 rpm. John Surtees is No. 1 team driver.



THE SHELL WHAT'S-WHAT OF MOTOR RACING

Just for the record, Shell summarise the main classes for you. There's one formula common to every class — Shell X-100 Motor Oil in the sump. The world's top racing drivers win on it.

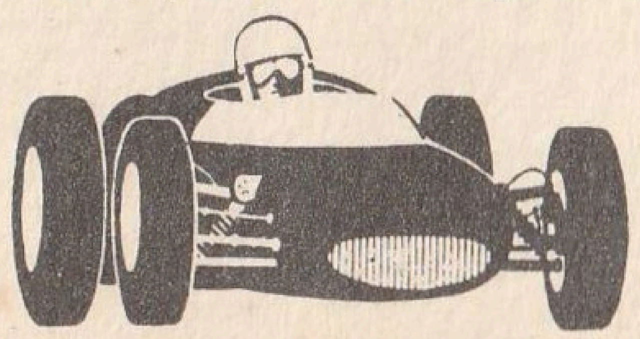
SHELL X-100 MOTOR OIL

FORMULA 1. *Motor racing's First Division. F1 cars contest the Grand Prix events. The F1 prescription: single-seat bodies, exposed wheels; engine limit 1500 cc, no super-charger; commercially obtainable fuel; minimum car weight 990 lb.; roll-bars compulsory.*

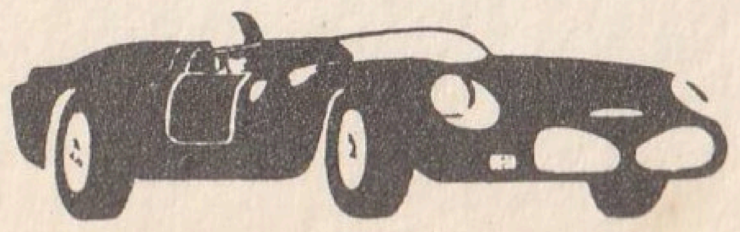
FORMULA Junior. *Nursery for Grand Prix talent. FJ cars look like scaled-down Grand Prix machines, but the 'fundamental elements' must be 'derived from a touring car'. Fundamental elements often include Ford and BMC production engines. Engine size is limited to 1100 cc.*

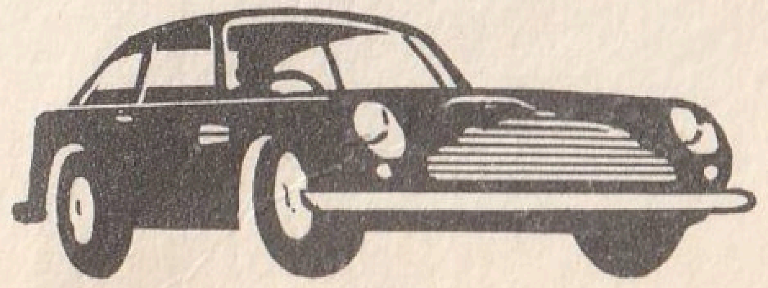
SPORTS CARS. *Everybody knows a sports car when he sees one, but the FIA takes nine printed pages to define it. It boils down to: 2 seats minimum; open or closed body. There are 15 engine displacement classes but no ceiling and no basement; silencers are compulsory.*

GT CARS. *GT is linguistically international — Grand Touring, Gran Turismo, Grand Tourisme. Akin to sports cars, though generally more habitable. At least 100 Grand Touring cars of given type must have been built before the model qualifies for racing.*


The new Formula 1 Lola.


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Ferrari, sports car par excellence.


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IT HAS TO BE GOOD TO BE SHELL

FORMULA 7 SEVEN

